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GOVERNMENT OF INDIA
MINISTRY OF FOOD AND AGRICULTURE

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REPORT
OF THE
INDIAN AGRICULTURAL TEAM
TO
U. S. S. R., POLAND AND CZECHOSLOVAKIA

September-October, 1954

PREFACE

The Report which was submitted by Dr. S. R. Sen, as leader of the Indian Agricultural Team which visited U.S.S.R., Poland and Czechoslovakia in September-October, 1954 contains much valuable information which is likely to be of considerable general interest. The Prime Minister, therefore, desired that this Report should be printed for restricted circulation to the Central Ministries, all Foreign Missions, State Governments and Universities. The Report is, therefore, being issued for "official use only". The views expressed in this Report do not represent those of the Government of India.

NEW DELHI;
March 1, 1956.

P. N. THAPAR,
Secretary to the Govt. of India.

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Conversion Factors

1 kilometre	1,000 metres =0·6214 mile
1 square kilometre	1 million square metres =0·3861 square mile =100 hectares
1 hectare	2·4711 acres

1 kilogramme	2·2046 lbs.
1 quintal (metric)	100 kilogrammes =220·46 lbs.
1 centner (Russian)	100 kilogrammes =220·46 lbs.
1 ton (metric)	1,000 kilogrammes =10 centners (Russian) =10 quintals =2204·6 lbs.
1 kilogramme per hectare	0·8921 lb. per acre
1 quintal per hectare	89·21 lbs. per acre =1 centner (Russian) per hectare
1 litre (of milk)	2·2889 lbs.

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1 rouble	100 copecks. =Rs. 1/3/-=As. 19
1 zloty	Rs. 1/3/-=As. 19
1 koruna	As. -/10/8

1 milliard	1,000 millions

CHAPTER I

INTRODUCTION

At the E.C.A.F.E. Conference held in Ceylon early in 1954 the leader of the Soviet delegation extended an invitation to countries of Asia and the Far East to send delegations to U.S.S.R. to study the development of industry and agriculture in that country. The Government of India accepted the invitation and decided to send a joint industrial and agricultural delegation in September, 1954. The delegation consisted of 15 members of whom the following five constituted the agricultural team:—

Dr. S. R. Sen—Economic & Statistical Adviser, Union Ministry of Food and Agriculture, New Delhi.

Shri C. P. Srivastava—Additional Director, Central Tractor Organisation, Union Ministry of Food and Agriculture, New Delhi.

Dr. P. M. Narainswamy Naidu—Director of Animal Husbandry, Government of Mysore, Bangalore.

Shri Abdul Rauf Kidwai—A practical farmer, Bara Banki.

Shri K. V. S. Murthy—Secretary, SEPTA Co-operative Farm, Nainital.

2. Amongst the other members of the delegation were three industrialists, one machine tool specialist, one transport engineer, one chemical engineer, one chemist, one officer of the Federation of Indian Chambers of Commerce and Industry, one officer of the Planning Commission and one officer of the Union Ministry of Commerce and Industry (please *see* Appendix I).

3. Shri Kasturbhai Lalbhai was the leader of the delegation as a whole and Dr. S. R. Sen was the leader of the agricultural team.

4. Shortly before leaving India, the delegation received an invitation from the Government of Poland to visit that country and the Government of India decided that they should spend about a week in Poland on their return journey from U.S.S.R. Shortly before the delegation left U.S.S.R. a similar invitation was received from the Czechoslovak Chamber of Commerce and it was decided that 4 members of the delegation should return to India *via* Prague instead of *via* Berlin as originally proposed and spend 4 days in Czechoslovakia.

5. The present report broadly summarises the findings of the agricultural team regarding the agricultural economy of these three countries with relatively greater emphasis on U.S.S.R. It concentrates mainly on three aspects:—

(i) general impressions of the country,
(ii) planning and administration of agriculture, and
(iii) agricultural conditions and practices.

More space has been deliberately devoted to the first two aspects especially for U.S.S.R. than is usual in reports of technical teams because unlike other countries so little authentic information is available in India about U.S.S.R. that it was felt that it would be useful to do so. Although the agricultural team devoted its attention mainly to agricultural problems, there were members of the team who being economists and engineers were also interested in general economic and industrial problems. The report, therefore, contains a few observations on these aspects also.

Difficulties of objective assessment.

6. There are such strong prejudices either for or against Soviet Russia that it is not an easy matter to make an unbiased assessment of men and things in that country. Besides, we must admit that we were working under certain limitations. In the first place our tour by its very nature had to be more or less a conducted tour because we were State guests. But even if we had gone on our own it would not have been very different. For, in a country like U.S.S.R. where distances are vast, everything including hotels and transport is State-controlled and security arrangements are very tight, any tour by foreign visitors cannot but be a conducted tour. Secondly, we did not know the local language and, therefore, it was essential for us to have always an interpreter with us. That inevitably meant that neither we nor the Russians whom we met could talk to one another as frankly as one might have done if no third party were present. Thirdly, most of the foreign visitors to U.S.S.R. tend to have pre-conceived notions and often a strong bias—and unfortunately it was not always easy for some of us to be absolutely free from this bias. Those who had leftist leanings tended to compare the best in U.S.S.R. with the worst in the western world while those who had a rightist bias tended to compare the worst in U.S.S.R. with the best in India or in U.S.A. Even those who were very careful to keep their own prejudices in the background often unconsciously committed the error of comparing uncomparables. For instance, some would compare the famous Metro in Moscow with trams in Delhi or the best cattle shown in the Agricultural Exhibition in U.S.S.R. with the ordinary cattle to be seen in India while others would make unfavourable comparisons between an automobile plant set up in U.S.S.R. in 1924 with one set

up in U.S.A. in 1950. Lastly, we found that the statistics that we could collect either from Russian sources or from elsewhere were also not beyond dispute and this added considerably to our difficulties. We have, however, tried our best to keep an open mind all through and to make the present report as objective as possible. We have based this report primarily on our personal impressions and observations and kept to the minimum such facts and figures as are readily available elsewhere in published form. But wherever we have used any statistics we have used only those which have been supplied to us by the Government. It is no use doing otherwise for a country like U.S.S.R. where the Government is the only source of information and estimates by any one else can be only a guess.

7. We would like to take this opportunity of expressing our gratitude to the Governments of U.S.S.R., Poland and Czechoslovakia for all the facilities that they placed at our disposal, to the various officials and experts for all the pains that they took at considerable inconvenience to themselves to make our visit as fruitful as possible and to the most competent and hard working team of interpreters whose ungrudging help and co-operation we shall never forget. Above all we shall always cherish the very friendly reception that we had from the people of all these countries. The great affection that they have for the Indian people and the high regard which they have for our Prime Minister have only to be seen to be believed.

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CHAPTER II

THE TOUR

The Delegation left India on the 4th September, 1954. The route lay through Cairo, Geneva and Vienna. Dr. S. R. Sen who was already in Rome in connection with the World Population Conference joined it in Geneva on the 5th September. It was at Vienna that the Soviet authorities, who treated the Delegation as State guests, took full charge of travel and other arrangements.

Russian transport plane.

2. The Russian plane in which we took off from Vienna for Moscow was the typical Russian civil transport plane. It was a Dakota type plane but somewhat bigger than a Dakota. The seats, cushions and upholstery were of a somewhat antiquated type but quite comfortable. The amenities provided were, however, much less than those provided in airlines in most other countries. The standard of food and drinks, in contrast with what we obtained in Russian hotels, was definitely austere. But this was more than made up by the efficiency of Russian pilots. The smooth way they take off and land their planes even on most improvised air-fields made of rough cement blocks or even tractorised fields of a collective farm without any noticeable bump is really remarkable. Throughout our thousands of miles of air travel in U.S.S.R. we did not experience even a single bump.

3. It was about 11 A.M. when we crossed the Russian border and flew across the river Dniester right into the plains of Ukraine. We were flying at the height of about 6,000 feet. There were stray bits of clouds below but the day was sunny and visibility was fairly good. There was a striking change in the landscape as soon as we crossed the Russian border. Even an ignoramus could not find any difficulty in discovering that he was entering a very different world of agriculture—a world of giant socialist collective farms. So long as we were flying over Austria, the land below looked like a chequer board—full of small farms of different sizes and patterns—patterns which are common to almost all non-communist countries. On the contrary in Russia as we looked down from the plane on the landscape below, we saw miles and miles of tractorised land stretching beyond the horizon, interspersed here and there with blocks of green forest lands. In every block of 5,000 or 10,000 hectares we saw in one corner a group of houses neatly arranged in several rows, each with a narrow but long strip of vegetable garden behind it. The picturesqueness of the Austrian farm houses and the variety of Central European farm and lands were no longer

there. The houses were rather plainly built—utilitarian in type—and the only variety that was there in the monotonous miles of tractorised land was the little patch of garden land which was given to each farm worker as a personal allotment. Even the forests appeared to be strangely similar and did not help break the monotony of the Ukrainian landscape. The monotony was no doubt partly due to the flat character of the Ukrainian plains. But we felt that the organisation of large collective farms was also partly responsible for it.

Ukraine.

4. Ukraine was under German occupation during the War for over two years and had suffered considerably from war ravages. At one time Ukraine was the land of small and medium farmers. It was the Kulaks of Ukraine who had fought a bitter civil war against the Bolshevic Government early in the twenties of this century. It was these Kulaks who had offered the strongest resistance to the collectivisation policy introduced by Stalin in the early thirties. In fact the opposition of the Kulaks was so strong that Stalin once confessed to Churchill that he considered it to be an even greater crisis in his life than the second World War when German guns were booming near Moscow. But during the 10 years which preceded the second World War the Kulaks of Ukraine were completely broken and small farms disappeared from the entire countryside. There is now nothing but large collective and State farms.

Kiev.

5. We landed at Kiev, the capital of Ukraine on the river Dnieper at about 1 P.M. As has been already mentioned above Ukraine was very badly damaged by the War and the city of Kiev was almost razed to the ground. Even 10 years after the battle which had been fought in and around Kiev, we could see shell holes and bombed farm buildings from the air. At the centre of the Kiev city a number of very imposing buildings—all public buildings—had come up. In the rest of the city we could see quite a brisk building activity but most of the buildings were of a very utilitarian type.

6. Kiev was the first city behind the so-called "iron curtain" that we had visited. It was the classical land of so-called "totalitarianism" and we expected to see a lot of uniformed people all around us. But the city of Kiev as a whole had an essentially civilian atmosphere. We could no doubt see quite a few people in uniform on the streets but their proportion was much less than one used to see in pre-war Germany or Italy. On the wall there was the usual picture of Lenin and Stalin which was pointed out by a member of our delegation as a sign of so-called "totalitarianism". At the same time there was an inscription on the wall which rather puzzled him because it did not quite fit in with his ideas of a Police State in which all criticism was taboo. It was a quotation from Stalin, "It is commonly known that no science can be

developed and be successful without the struggle of opinion and freedom of criticism".

Moscow.

7. It was about 3 P.M. when we took off from Kiev for Moscow. The journey was as uneventful as before and the landscape as monotonous. It was about 8-30 P.M. when we landed at the Moscow airport. The airport at Moscow is no doubt quite a big one but it is still relatively simple compared to the airports of most of the West European Capitals. It is not certainly more imposing than the Palam or Dum Dum airports. But it is much more busy. During the few minutes that we were there we saw a couple of planes coming and going every minute. All those planes were of the same type as the one by which we travelled. There is a degree of standardisation in U.S.S.R. which would strike any visitor from outside. There is little variety in the country. There are only a few types of planes, motor cars, tractors or buildings and these are being produced on a mass scale. The varieties of planes that one sees on a Swiss airport or of cars that one sees in a town in the Middle East have no place in U.S.S.R.

8. At the Moscow airport we were received by our Ambassador Mr. K. P. S. Menon and the Russian Deputy Minister for Foreign Trade Mr. Koval and an army of officials and newsmen and a battery of movie cameras and flash bulbs. We were then led to our cars which looked exactly like the old Packards one used to see in 1947-48. The cars looked quite powerful, smart and comfortable.

9. The aerodrome is about 30 kilometres from Moscow and the road along which we sped towards the city was undoubtedly one of the best we had ever seen. A broad road, flanked with rows of trees, the leaves of which had just begun to turn brown with the advent of autumn, and with the skyline of Moscow at the distance, looked very pleasant specially after the rather monotonous landscape which we had been looking at from the plane ever since we had left Vienna early that morning. After about 10 minutes' drive from the aerodrome as we turned the corner we saw a very imposing building decorated with coloured bulbs as if it was the Diwali day. It was something like a sky-scraper tapering above into a minaret. We were told that this was the famous new building of the University of Moscow and was an example of the Russians trying to compete with Americans in the construction of sky-scrapers. Although it is a sky-scraper, it is nevertheless a beautiful building and reflects credit on the Russian architects.

10. Moscow is a city of imposing buildings and of broad streets. In the main streets the buildings are mostly Government offices or hotels or department stores. In other streets there are mostly apartment houses, at least so far as the front line is concerned. Behind the front

line there still persist old buildings from the Tsarist days, most of which are in rather poor condition and behind the corners one could even discover shacks—little hutments of iron sheets and timber which sheltered some hapless families who had a very low position in the allotment list of the Moscow equivalent of our New Delhi Estate Office. As a result of the War which led to the destruction of 70 million sq. metres of houses in Russia and also as a result of post-war migration of people from the country to the towns there is a tremendous shortage of housing space in every Russian city and the shortage is the acutest in Moscow. Although Government has given a very high priority to building activities and we found all around the suburbs of Moscow new apartment houses going up, there is still a considerable shortage of houses so that many families are still obliged either to share rooms or to live in wooden shacks.

Hotel Metropols.

11. The hotel to which we were taken was the famous Hotel Metropole originally built in Tsarist times. It was badly damaged during the War and the front of it still showed scars of aerial bombardment. In fact when we were there, workmen were busy repairing the front and giving it a new look. But the inside of the hotel was quite richly furnished with velvet curtains, gilded furniture, marble statues, etc.—although in somewhat antiquated style. The hotel faced the Revolution Square which contained a very beautiful park. On the right side was the famous Bolshoi Theatre and a huge modern hotel, the Hotel Moscow, stood opposite and in the corner could be seen a tall imposing building which housed the Gosplan, the famous Russian Planning Commission. The streets below were quite well lighted, street cars and buses passed quite frequently and there was at a distance a station of the famous Moscow Metro where streams of people were pouring in and out. The Moscow buses and street cars looked quite modern and efficient, very much like the ones in Rome. There were, however, much fewer cars on the streets than one sees in the cities of Western Europe and there was almost complete absence of bicycles. It appears that most of the people in Moscow travel either by street cars and buses or by Metro and it is only the high officials either of the Government or factories or foreign diplomats who travel by cars.

Soviet Ministry of Foreign Trade.

12. On the following morning we paid a courtesy call to the Ministry of Foreign Trade. The Ministry of Foreign Trade is in one of the most impressive and modern buildings we saw in U.S.S.R. Not only are the Russians great builders but they also believe in putting up a very grand show wherever they have any contact with foreigners. The marble floors, the glass panels, chromium plated fittings and the heavy pile carpets of the Ministry gave the visitors an impression of not merely

prosperity but also of ostentation . The Committee Room in which we were received by the Soviet Minister of Foreign Trade and his senior officials has nothing like it in New Delhi although New Delhi has some of the most imposing office buildings in the world. The Minister in a very friendly speech praised India's foreign policy and expressed the hope that the joint efforts of India, U.S.S.R. and China would help maintain the peace of the world and that increasing trade and technical co-operation between the two countries would foster the economic prosperity of both.

13. We spent a large part of our first week's stay in Moscow in studying carefully the Agricultural Exhibition which represented all that was best in Russian agriculture, and in having discussions with the officials of the Ministries of Agriculture, State Farms and Finance and the Planning Commission and the experts of various research institutes *e.g.*, Lenin Academy of Agricultural Sciences, Timiriazev Academy of Agriculture, Institute of Economics, etc. We also visited a few collective farms, factories, schools, hospitals, creches etc. and were shown a few ballets and operas at the famous Bolshoi Theatre. Detailed accounts of the Agricultural Exhibition and some of these visits and discussions have been given in subsequent chapters. The Russian ballets and operas are world famous and it is hardly necessary to dilate on them in this report. We may only say that they have reached a standard of perfection in choreography, in stage-craft, in acting and in music which is difficult to believe unless one sees it.

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14. One morning we were taken round the new building of the Moscow University by its Rector, Dr. Petrovski. It is really a magnificent building and rivals some of the biggest sky-scrapers in U.S.A. It is 250 metres in height, built of marble and contains 6,000 rooms for students and 200 apartments for professors. It houses only the Natural Science Sections of the University at present. We went round the class rooms and laboratories. Laboratories seemed to be quite well equipped. The rooms for students were also decent. We went into the room of a Mongol student from the Khirgiz Republic, Mr. Yargesh, who was studying biology. He seemed quite happy and assured us that he did not find any difficulty whatsoever on grounds of race or complexion. The average student at the Moscow University seemed to be much more of a serious type than his confreres in Western European Universities. There were quite a large number of women students. We were told, however, that co-education had been banned by Stalin in 1943. But as a result of agitation from parents and teachers it has been re-introduced recently.

15. Giving us a brief idea of the educational system in U.S.S.R., Dr. Petrovski told us that in U.S.S.R. almost every third person attends some sort of course and that there are several million regular students. Approximately 1/6th of the students passing the High School Examination go to the University. Before the Revolution there was considerable illiteracy in U.S.S.R. But they were able to abolish illiteracy altogether in 1931. There is now general compulsory education upto Class VII. They hoped that in the near future general education upto Class X would be made compulsory. Education upto Class VII is free. After that stage children of well-to-do parents have to pay a fee of 200 roubles per annum in schools and 400 roubles per annum in Colleges and Universities. By well-to-do parents, Dr. Petrovski meant parents having an income of more than 850 roubles per month. Those who have lower income do not have to pay any fee for the education of their children. Besides fee, a student has to pay 15 roubles per month for the rent of his room if he stays in a hostel. The total cost of education of a student living in a hostel comes to about 250 to 300 roubles per month including boarding, lodging and tuition fee. Dr. Petrovski explained, however, that about 96 per cent. of the students in the Moscow University and quite a high proportion in other Universities are in receipt of stipends from the State varying from 250 to 300 roubles per month. Both admission to the University and the award of stipends are usually made on the basis of competitive examinations although there are some exemptions.

16. As we were interested in agriculture, Dr. Petrovski was very anxious that we should see the Biology and Soils Faculty of the University which was housed in a separate building. We were received by the Dean, Professor Voronin, who is also the Head of the Department of Biology. Most of the professors appeared to be persons deeply interested in their work. The Professor of Fisheries was very anxious to get samples of the Indian fish and to know more about Indian fisheries. He seemed quite familiar with the names of Indian scientists in the field and mentioned the works of a few of them.

Russian Railways.

17. On the night of the 14th September we left for Leningrad by train. This was our first experience of a Russian train. The train by which we were to travel from Moscow to Leningrad was supposed to be one of the fastest trains in U.S.S.R. and was called the Leningrad Express. But although the train did not stop anywhere between Moscow and Leningrad, it took as much as 10½ hours to travel the distance of 620 kilometres or about 385 miles between Moscow and Leningrad. Judged not only by European trains but even by Indian trains this was not certainly a fast speed.

18. The Russian gauge is bigger than the standard gauge which is in vogue in Western Europe but is smaller than the broad gauge which we have in this country. The trains are usually corridor trains, but we did not find passengers moving from one carriage to another. There are altogether four classes in Russian railways. There is a Special Class for V.I.P's, then there are First Class, Second Class and Third Class. The Russian Third Class has wooden benches and has more or less the same standard as the Indian Third Class. We travelled by First Class. The Russian First Class coach is somewhat like the pre-war corridor type European first class coach.

19. Since we started at night we could not see much of the country-side. But whatever we could see appeared to be rather flat and monotonous. Vast stretches of grain land, mostly wheat or maize, interspersed here and there with forests and dotted with occasional beds of cabbage or turnip or vegetables in small individual allotments were all that we saw during the five hours of day light before we reached Leningrad. The towns and villages which we saw on the way did not give that bright and clean appearance which one gets in Germany or Denmark, but they were not very bad either.

Leningrad.

20. We arrived at Leningrad at 10-45 A.M. A surprise awaited us when we got down from the train. The Mayor of the City and a group of ladies and gentlemen were there to greet us with bouquets of flowers. Out of the group came out a youngman of about 25 with one arm amputated who presented a bouquet to one of us and greeted him in Bengali. To be greeted in Bengali in Leningrad and that too by a Russian was the last thing that we had expected. The youngman told us that there was an Institute of Oriental Languages at the Leningrad University where Bengali was taught and the Government gives special scholarships for students learning oriental languages. He had lost his arm in the War and he felt that he should become a specialist in oriental languages and so for the last three years he had been learning Bengali at the Leningrad University. He had read works of Bankim Chandra, Rabindra Nath and Sarat Chandra. There were eight other students learning Bengali at the Leningrad University, besides a dozen who were learning Hindi. We found later that one of our guides in Moscow knew fairly good Hindi and the air hostess who travelled with us to Tashkent knew Urdu.

21. The Hotel where we put up was quite modern and comfortable and was called Hotel Astoria. Our rooms were on the first floor over-looking a big square and an imposing statue of Tsar Nicholas I who was one of the most tyrannical monarchs of Russia and had suppressed most cruelly the Revolution of 1825. We feel that people in India who are pressing that all the statues of former

rulers of India should be destroyed should take note of the fact that in U.S.S.R. no work of art has been allowed to be destroyed. Tsar Nicholas I may have been a tyrant and may have been hated by the revolutionaries but by preserving the statue U.S.S.R. is honouring not him but the artist who made the statue. We noticed in the lounge of the Hotel quite a few foreigners. Most of them were no doubt members of foreign delegations like ours but there were also a few tourists and foreign businessmen. We saw an advertisement in the Hotel itself of a tourist service between London and Leningrad run by a Polish Shipping Line. This showed that Leningrad at least was not so much isolated from the rest of the world as most of the other Russian cities were supposed to be.

Museum of Russian Art.

22. After lunch while the engineers went to see a factory for manufacturing electrical engines, a few of us were taken to see the Museum of Russian art. We in India know quite a good deal about the art of Western Europe but practically nothing of U.S.S.R. In fact it is doubtful if even Europeans know much about it. The Museum of Russian art was, therefore, worth visiting. It was built early in the 19th Century and contains paintings by Russian artists since the middle ages. A distinct historical evolution can be traced in the development of Russian art. Paintings in middle ages represented only religious subjects—mostly Icons. Portraits of Kings and Nobles made their appearance primarily during the first half of the 18th Century. The most famous artist of this period was Nikitin who was remarkable for the fact that his portraits of Peter the Great represented the builder of modern U.S.S.R. not in Royal robes and not as King but in the plain dress of an ordinary citizen. From the middle of the 18th Century, however, French influence began to be very marked and Tsars and princesses and the aristocracy began to be painted in all their plumage. Soon after, however, the age of landscapes and mosaics began—gradually mythology, history and wars also became subjects popular with the Russian painters. Common men and women made their appearance in the Russian Portrait Gallery only in the second half of the 19th Century. Post-Revolution Russian paintings are very realistic—in fact almost photographic. Although technically they are most excellent and have a beauty of their own, one wonders whether they have not gone too far in the direction of realism.

23. After the Art Museum we went to the banks of the river Neva just in front of the famous Winter Palace of the Tsars which has now been converted into a Museum. The Winter Palace is a building of great historical importance because it was the attack on the Winter Palace by the rebels of the Russian Navy which was one of the

most important events in the annals of Russian Revolution. A part of the Winter Palace is now being used as a Museum, mostly for housing pictures painted by non-Russian artists.

24. The river front of Leningrad is really very beautiful. On the opposite side there are the famous Peter and Paul fortresses and the two Rostral towers built by Peter the Great, the Academy and the University. On both sides of the Winter Palace there are beautiful gardens and statues and palaces of which the statues of Peter the Great and Empress Catherine II, the summer garden about which Pushkin has written so much, the martyr's park and the small palace where Peter the Great used to live are worth mention here. The other buildings which we saw were the Victory Tower, the Offices of the General Staff and the Admiralty, the Isaac Cathedral and the Smolny from which Lenin directed the Revolution of 1917. Leningrad is full of churches and cathedrals. Although many of them have been converted into Museums, there are still a few which are functioning and we saw priests of the Greek Orthodox Church going about the streets freely. We were told that although the State in U.S.S.R. is secular and the Communist Party discourages religion and carries on constant propaganda against the influence of the priestly class there is no direct interference with religious practices. People are permitted to practice their own religion in their individual capacity. We saw evidence of it when we visited houses of collective farmers which were usually full of Icons.

Botanical Institute.

25. On the following day we visited the Kamarov Botanical Institute in the morning. Originally a vegetable garden started by Peter the Great in 1714, it gradually developed into a well-known botanical garden and botanical institute during the 19th Century and was converted into National Research Institute for Botanical Studies in 1917. Academician Kamarov was its Head until his death in the early forties since when it is being called after his name. The Institute is situated in an imposing building in a very spacious botanical garden and has special hot houses for tropical plants in which many Indian plants are also being grown. An interesting item is a lotus plant grown from a 6,000 years old seed discovered in China a couple of years ago. The annual budget of the Institute is 10 million roubles. It has 8 Divisions and a library of 200,000 books including a number of Indian books, a collection of 5 million specimens and a staff of about 400.

People of Leningrad.

26. In the afternoon we visited a State Farm—the Lesnoy State Farm in the Stalin District of Leningrad City about which a detailed account is given in another Chapter. While going to this farm we passed through certain back streets of Leningrad where the buildings

were very old and dilapidated and a great contrast to the magnificent buildings which we saw near the main streets of the city. The building of the State Farm itself appeared to be old and without repair for a long time. Near the State Farm there was a marsh, a part of which the Government was reclaiming. We were told that during War the Germans had come as near as the other side of the marsh and there was very heavy fighting in this area for over 300 terrible days.

27. The people of Leningrad have suffered very heavily from the War as very few citizens of the World have done. For nearly a year they were cut off from the rest of the World and were under constant bombardment from the German artillery and aircraft; there was no food and no coal and thousands of people were starved or frozen to death.

28. But in spite of the suffering that they had to go through, people of Leningrad still retain a certain standard of culture and art which is of a much higher standard than what one comes across in other parts of U.S.S.R. not excepting Moscow. For centuries Leningrad was the centre of culture for Russia. It was Leningrad where Pushkin lived and wrote. It was Leningrad where all the great Philosophers and Scientists and Writers of Russia gathered, and Leningrad still retains the glamour which Tchaikowvsky and Pushkin, Mendeljev and Nikitin bestowed on the city. In fact in the Mayor's Reception in Leningrad we met more people of culture at one place than we had met elsewhere in U.S.S.R.

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Peterhof Garden.

29. The following day, the 18th was a very busy day for us. Almost the whole of the day we spent at the Lenin Institute of Plant Breeding and its attached hot houses and experimental farms about which a detailed description has been given elsewhere. After we had finished our discussions at the experimental farm there was a couple of hours of day light still left and Mr. Fillipov who was accompanying us suggested that we should see the Peterhof garden nearby which was originally built for Catherine the Great but was later on converted into a public school. Pushkin whose memory seems to be associated with anything that is important in Leningrad was a student at this school and we were told that it was a must for us. Peterhof has a beautiful park and a garden around a blue lake on one side of which stands the hunting lodge of the Tsar and on the other his palace. Unfortunately the palace was almost completely destroyed by the Germans during the War. The Russians have now rebuilt a part of it and converted it into a Museum. There are on display various articles used by the Tsars—clothes and crockery, sculptures and paintings etc.

Stalingrad. 30. On the morning of the 19th we started for Stalingrad—a long flight of 6 hours from Leningrad. We passed over Moscow at about 9·30 A.M. The weather was rather cloudy all the way from Leningrad to Moscow and hence little could be seen from the plane. After Moscow, however, the weather cleared up. The country was as usual monotonously flat all through—mostly steppe land as we approached the south. Large grain collective farms could be seen from the air. In fact collective farms seemed to become larger as we proceeded south and these were interspersed with forests. Near the Stalingrad region traces of war-time damage, shell holes, trenches, tank tracks and burnt out villages could be seen from the air, even 10 years after the War. We reached Stalingrad at about 1 P.M. and were received by the Mayor and the Deputy Mayor of the City. The Deputy Mayor was a lady who seemed to be very capable. We had to drive quite a long distance from the aerodrome to the Stalingrad city through a rather dusty road and were told that dust was the most characteristic feature of steppe land.

Intourist Hotel.

31. The hotel in which we were put up—'The Intourist Hotel', was a make-shift affair in a war damaged building. The rooms were no better than a second class hotel in India and there were only two lavatories and one bath room. There were, therefore, long queues but all of us put up with it gladly. After all we were lucky that we had got even this in a city like Stalingrad which was completely razed to the ground during the War. We also appreciated it for another reason. We were told that in rebuilding Stalingrad first priority was given to apartment houses for workers and last priority was given to hotels.

32. After we had our lunch, the Mayor showed us round the city. Stalingrad is an unusually long city—60 kilometres long along the Volga and only 6 kilometres wide. It is divided into two by the Mamai Hills and its population is now about 5 lakhs as against 1 million before the War. Stalingrad, as is well-known, was the scene of the fiercest fighting during the War for 100 days from August, 1942 to February, 1943 when every street and every house became the battle front and the city was completely destroyed. The Mayor took us to the various war memorials—especially to the Mamai Hills and Pavlov's house where the most fierce and memorable actions had taken place. Even after 10 years the place was strewn with fragments of shells. From the Mamai Hills, where for every square inch of land 100 men had died, we had a striking view of the city and the river Volga beyond. The city was being reborn like a phoenix out of the ashes. New apartment houses, operas, theatres, palaces of culture were coming up amidst skeletons of war-damaged buildings which were being pulled down. Beyond the city, old Volga flowed on—the river which has been intimately connected with all the joys and

Mamai Hills.

sorrows of the Russian history. We were also shown by the Mayor a film of the battle of Stalingrad which brought home to us, as nothing else could do, the horror and inhumanity as well as the heroism of War.

33. Stalingrad had been almost three-fourths rebuilt when we visited it. New factories and large apartment houses, city halls and shops were coming up fast. The day we reached Stalingrad the Planetarium was opened and there was a big holiday crowd to see the wonders of the sky. Although a lot still remained to be built up, whatever was built up was a real surprise to us. The War had left the old city a complete rubble. It would have been much cheaper to rebuild a new city on a neighbouring site but on considerations of morale—and we think rightly—the Russian authorities decided to remove the rubble and build the new city on the very old spot. The house which Sergeant Pavlov had defended for 54 days had been completely restored. Every spot where a memorable action had been fought or particular heroism shown has been marked with a suitable memorial. We had no doubt that all this would pay good dividends in future in terms of national morale.

34. On the morning of the 20th September we drove to the famous Stalin Tractor Plant of Stalingrad. The Tractor Plant is about 20 kilometres from the Hotel and the road ran parallel to the Volga river. On both sides of the road we saw many war damaged buildings but there were also many new apartment houses coming up. These apartment houses were not very good from the architectural point of view but the reason was quite obvious. The Russians wanted to put up apartment houses as quickly as possible and, therefore, they were sacrificing to a certain extent architectural beauty in favour of quicker and cheaper construction. Stalingrad is a highly industrialised city and on our way we passed by several factories of which the most notable was the Steel Plant.

Agriculture in Stalingrad.

35. In the afternoon we went to the Department of Agriculture and the Planning Commission of the Stalingard Oblast (or region). The Director of the Stalingard Department of Agriculture, Mr. Sergiev, and the officials of the Agriculture Department and the Planning Commission who received us seemed to be intelligent and capable men. They gave us a number of interesting facts about agricultural practices in the Stalingard area and explained in considerable detail the problems of planning at the Oblast level.

People of Stalingrad.

36. In the evening we visited the river front of Stalingrad which was completely ruined during the War but has now been built into a beautiful park. Along the river front there is a children's railway having real engines and trains and these are run entirely by children. When we were

there, there was quite a large crowd in the park and people seemed to be very gay. In fact people of Stalingrad seemed to be much more gay and merry compared to people of Leningrad or Moscow. Almost all the women were well dressed and the use of cosmetics was quite common. A number of steamers and boats were plying in the river and there were also a few row boats for the use of the young men and women of the locality. There was also a bathing beach which we were told was frequented by quite a large number of people in summer. On the whole we were impressed with the morale of the citizens of Stalingrad. The severe punishment which they had to take during the War did not seem to dampen their spirits. On the contrary they seemed to us the gayest people we had seen so far in U.S.S.R.

Volga Don Canal.

37. On the 21st morning we took a cruise up the Volga river and the Volga Don Canal. Volga is a very busy trade route for Russia and there was quite a large traffic on it. At the entrance of the Volga Don Canal there is a huge statue of Stalin and it was under the shadow of the statue that we entered the canal. The way the lock-gate operated, water poured in and out of each lock and we were raised higher and higher was very interesting. On both sides of the canal new townships were coming up and the whole area pulsated with a new life.

38. In Stalingrad our delegation was split into two. One batch proceeded to Zaporasia and Rostov and the other flew back to Moscow en-route to Tashkent and Andhijan. The Steel plant in Zaporasia, the famous Dam on the river Dnieper and the huge agricultural machinery factory at Rostov were some of the interesting places which were visited by the first batch. The second batch which comprised of 4 members of the agricultural team preferred to concentrate on studying agricultural and animal husbandry problems in Uzbekistan. En route to Tashkent. this batch had to spend two days in Moscow where it attended a function which deserves special mention here because it was not only very different from all the other functions that we have attended in U.S.S.R. but revealed an interesting aspect of the Russian character which is not commonly known.

Soviet Ministers and Diplomats.

39. The Indian Ambassador in Moscow, Mr. K. P. S. Menon, had asked a number of Russian Ministers and high dignitaries to dinner to which he also invited us and a few members of the Indian Films Delegation who were there at that time. Amongst the Russians invited to the dinner were Mr. Saburov, Chairman of the Planning Commission and Deputy Prime Minister; Mr. Mikoyan, Minister for Trade and Deputy Prime Minister; Academician Alexandrov, Minister for Education and Culture; Mr. Zeverev, Minister for Finance; Mr. Benedictov, Minister of Agriculture; Mr. Gromyko, Deputy Minister for External Affairs;

Mr. Kuznetsov, Deputy Minister for Foreign Affairs, Mr. Koval, Deputy Minister for Foreign Trade; Mr. Mitskevitch, Deputy Minister for Agriculture and Mr. Smyrnov, Mayor of Moscow. At the dinner the Soviet statesmen who look so formidable from a distance, relaxed completely and looked as human as any other group of people we have ever met. There were frequent exchanges of pleasantries in course of which Mrs. Gromyko accused one of the Directors of Soviet Films of being too serious and utilitarian and pleaded that the Russian film producers should try to put in a little more of the love element in the Soviet films. A good many toasts were proposed and drunk and there were four or five speeches. The most remarkable speech was, however, from Mr. Saburov. He said that India had sent some officials to learn about Russian planning. He did not know what U.S.S.R. could teach India. Of course U.S.S.R. had somewhat longer experience in economic planning and that meant longer experience of mistakes also. If India could learn from U.S.S.R. what mistakes not to commit perhaps that would be a good training. In any case he hoped that after a few years the Russian officers would be going to India to learn more about planning. And he ended up with saying that U.S.S.R. like India genuinely wanted peace because both countries have to do so much within their own territory that none of them have any time for adventures abroad. Mr. Saburov's tone of friendliness was even more impressive than what he said in so many words. It was also rather remarkable that the Chairman of the Russian Planning Commission would be admitting in public that all that the Russians had done in the past was not beyond question,—that they had committed some mistakes which they regretted now and which they did not want others to commit. Then someone in the gathering referred to a news item in the *London Times* which said that the Soviet Russia was wooing India and a Russian guest observed that there was no need for wooing India because both India and Russia were wedded to the idea of peace. Then followed the most remarkable part of the evening. After the last toast was proposed, Mr. Alexandrov expressed a desire to hear an Indian song from the members of the Indian Films Delegation. A member of that Delegation said that there should be some *quid pro quo*. Since the word wedding was mentioned that evening, he suggested that both the parties present should sing songs because that was the custom at wedding ceremonies in India. The Russians accepted the challenge. It may be said that it was good sportsmanship on their part because all of them were fairly elderly people, mostly statesmen and diplomats and they should have normally hesitated to match their voice against a group which contained some film stars. Mr. Anil Biswas from Bombay Films on our side started with a song to which Mrs. Gromyko and another Russian lady gave a reply. Then followed a number of chorus songs from both sides and we must admit that the Russians did better than the Indians although at the start we had

Mr. Saburov's speech.

thought that it would be otherwise. And these chorus songs in which people like Saburov, Mikoyan, Alexandrov and Mrs. Gromyko participated went on until mid-night. We doubt if in any similar gathering of high dignitaries such conviviality would be possible in any other country. We also wonder whether at the parties given by other foreign embassies in Moscow such friendliness is usually displayed by the Russian statesmen.

Tashkent. 40. We left Moscow that very night at 3 A.M. for Tashkent. It was a long and rather tedious plane journey of about 14 hours with only one stop at Aktobynsk in the Kazak Republic just near the southern tail of the Ural mountains at about 9 A.M. Moscow time. We reached Tashkent at about 5 P.M. Moscow time and at 8 P.M. Tashkent time. The first half of the journey was over the usual flat grain lands of U.S.S.R., miles and miles of tractorised farm lands, interspersed with collective farm buildings, laced with garden plots and broken only by stretches of forests. The second half of the journey was over arid, almost desert, areas until we came to the valley of Amu Dariya near Tashkent. But the desert was also flat. The hills and undulated sand dunes which lend some sort of grandeur to the African desert were lacking here. The valley of the Amu Dariya was, however, a very pleasant change. Green patches of rice, cotton and lucerne fields criss-crossed with rivulets and canals, with small hills in the horizon, presented a picture of freshness which we had missed for thousands of miles.

41. Tashkent from air looked like an average Punjab town or perhaps we should say an average town of the Middle East. There was the usual centre of the town with big streets and palatial buildings with a few chimnies of factories trying rather impudently to reach the sky here and there. But suburbs were mostly full of narrow dusty roads and dilapidated buildings and mud huts surrounded by mud walls with worn out thatch or broken tiles for roof. At the airport we were received by Mr. Orgashev, Deputy Minister for Agriculture of the Tashkent Republic; Mrs. Yusupova, Mayor of Tashkent, Mr. Shenimagtov, First Secretary to the Ministry of External Affairs of the Uzbek Republic and Dr. Sadikov, Director of the Institute of Cotton and a Member of the Academy of Sciences.

42. The place where we were put up was about 12 kilometres on the other side of the town. We had to cross the city first through broad and long streets and then through comparatively narrow streets with low houses on both sides which had much the same look as some of the town houses of Northern India. There was definitely an oriental flavour in the whole atmosphere. As soon as the municipal limits ended, the road ceased to be tar macadamised and was paved with stones until we came to a place where we had to take a turn to the left. There the road became a dusty gravel road until we reached the place where we were to stay. It was a beautiful and fairly large villa set in a charming

orchard. We learnt that it was the Rest House meant for the Ministers of Uzbekistan. Since all the hotels in the city were taken up by an International Medical Conference which was then in session in Tashkent we had to be put up in this Rest House. Anyway it turned out to be a fortunate thing because it was very near to a collective farm and a small Uzbek village both of which were of considerable interest to us and could be studied by us outside our official programme and all by ourselves.

43. We started the following day, the 24th September, with a visit to the second Yangi Ulskaiya or "New Way" Machine Tractor Station at a distance of about 25 kilometres from Tashkent. This Station seemed to be quite an efficiently run organisation and the surroundings were also quite pleasant.

Uzbek Agriculture.

44. In the afternoon we had a meeting with the Deputy Minister and the various officers of the Uzbek Ministry of Agriculture who gave us a background of the administration of agriculture in the Uzbek Republic. Uzbekistan has a very old history. It formed a part of the empire of Taimoor and became the centre of the Mogul Empire in Central Asia. Samarkand and Bokhara in Uzbekistan became very prosperous trade centres and in old days there was considerable trade between Uzbekistan and India. Baber, the Founder of the Mogul dynasty in India, came originally from Uzbekistan. But by the beginning of the 19th Century, Uzbekistan fell into evil days and was conquered by Tsarist Russia. It lost all its previous glory and became moribund. Then came the Russian Revolution. Gradually the entire life of the Uzbeks was transformed. Small farms were replaced by big collective farms, the area was industrialised, the hold of the priests was shaken off and during the second World War in particular there was a large migration of Russians from Ukraine and other places occupied by Germans and a very rapid economic development of the area followed. From one of the back waters of Central Asia Uzbekistan today has become one of the most prosperous States of U.S.S.R. The main industries of the Republic are cotton, wool and silk textiles, oilseeds crushing, manufacture of agricultural and other machinery, coal mining, petroleum refining, hydro-electric stations, etc. The main agricultural produce of the Republic is cotton, silk, karakul skins, rice, wheat, barley, fruits and vegetables, etc. The Uzbek Republic produces as much as 2/3rd of the total cotton crop in the Soviet Union and most of this cotton requires irrigation and hence a special emphasis has been given to irrigation. Cotton which is the most important branch of Uzbek agriculture has received special emphasis ever since the Revolution. While before the Revolution only 50,000 tons of cotton were produced in Uzbekistan, the present production is over 300,000 tons. The yield has increased from 120 kilogrammes per hectare to 220 kilogrammes per hectare on the average. Some of the collective farms have 8,000 hectares under cotton and yield

as high as 350 to 400 kilogrammes per hectare. In some fields yield as high as 600 to 700 kilogrammes per hectare has been obtained. The most popular variety is Farghana 108 which is comparable to Egyptian cotton. 80 to 90 per cent. of the income of the average collective farm in Uzbekistan comes from cotton. Thanks to the high prices that they obtain for their cotton and other agricultural produce, most of the collective farms in Uzbekistan have a very high income, 90 per cent. of them have an income of more than a million roubles each. Various agricultural operations have been highly mechanised in recent years. The extent of mechanisation for cotton is as high as 95 to 100 per cent. for ploughing, 98 per cent. for sowing and 70 per cent. for cultivation. There is a special department for the development of new machines and improvement of old machines. Special cotton harvesting machines have been designed and produced in Tashkent itself. At present 40 per cent. of the cotton harvest is mechanised. Present plans are to mechanise as much as 80 per cent. in the course of the next 4 years. Since Uzbekistan is a very good cotton-growing area and there is a great need for cotton in U.S.S.R. special steps are being taken to reclaim as much virgin land as possible in Uzbekistan and put this under cotton cultivation.

An Uzbek opera.

45. That evening we were taken to see an Uzbek opera. Russian operas and ballets are famous all the world over and we had already seen quite a few of them in Moscow and Leningrad. But the Uzbek opera that we saw in Tashkent deserves some space here not because of its artistic excellence but because it had certain social implications which were both interesting and significant. The name of the opera was 'Gulsara' and it was written by an Uzbek composer, Sadikov—a short and intelligent looking man who received us with a great show of affection for India. Sadikov, we understood, was also the conductor of the music. The music was quite good but the opera was a rather crude propaganda against the authority of priests as well as parents. Gulsara was the daughter of an orthodox Muslim tradesman and was married to a young school teacher who had progressive ideas. Gulsara's husband was against purdah and wanted Gulsara to give up the purdah. This upset the Muslim priests who told Gulsara's father that he would not be allowed to go to the mosque if his daughter gave up the veil. Moreover, he was sure to be condemned to eternal damnation for the modern ideas of his daughter. Gulsara's father became very upset at this and wanted to know what he should do. The Muslim priests told him that he should either persuade Gulsara's husband to change his ways or take away Gulsara from her husband's control and in the last alternative should be prepared even to kill Gulsara's husband, if necessary. Gulsara's husband was adamant and would not consent to giving up his modern ways and hence Gulsara's father took away Gulsara to his own house. Gulsara was lamenting her fate when her husband came with some members of the Communist Party

and Gulsara related to them her tale of woe. Questioned by the members of the Communist Party, Gulsara's father promised to be on good behaviour in future but after the members of the party left he was so enraged that he threatened to kill Gulsara. Gulsara's mother intervened and helped Gulsara to run away. But in the melee which occurred, Gulsara's father accidentally killed Gulsara's mother. The last scene showed that Gulsara's father and the mullahs were being taken away to the jail by the Soviet police while Gulsara and her husband and all their girl and boy friends made bonfire of veils and changed into frocks and trousers and started a very gay ball dance on the stage. At the end of the play the Director of the opera, Novorosky, came to see us off. He praised the struggle of Indians against the British, condemned very strongly all imperialism and tried to impress upon us the moral of the story how under the Russian tutelage backward Uzbekistan had become so progressive. But in spite of all the material progress that we saw in Uzbekistan we could not forget that what we saw in the opera was not only a crude propaganda in favour of western clothes but was also an incitement to the young people to disobey their parents. We could understand the propaganda against the priests. Some people in India are also doing that. But the propaganda which showed the father in such a bad light was obviously an attempt to weaken the hold of the family in favour of the State and the Party.

Russianisation of Uzbek Culture.

46. In fact it was our impression about Uzbekistan that it was gradually losing its cultural entity. No doubt the Russians were building new palaces and opera houses and theatres in the so-called Uzbek style but the British had also done similar things in India. Somehow we could not help feeling that 35 years of communist rule had russianised Uzbekistan to a much greater degree than 200 years of British rule had anglicized India. The local culture, the local religion and the local dress had been influenced to a much greater extent in Uzbekistan by those of the ruling power than ever was the case in India.

Farghana.

47. Ever since we came to Uzbekistan, what we had read in Baber's autobiography kept on haunting some of us. We were curious to see what could be there in Farghana that Baber should say that even all the wealth of India could not make him forget his old kingdom of Farghana. So we made a special request to the Russians to show us Farghana. Moreover, Farghana was the most important cotton growing tract in Uzbekistan and the Deputy Minister for Irrigation told us that they had some of their best irrigation works at Andhijan and Farghana. We were anxious to see how good the Russian irrigation equipments really were under actual field conditions. Hence early on the morning of the 25th September, we started for Farghana and Andhijan Mr. Karzarin, the Deputy Minister for Irrigation, accompanied us.

48. On the way to the aerodrome we made a detour and went round some of the old parts of the city of Tashkent as well as some of the suburbs. The contrast between the old city of Tashkent and the new city is almost the same as that between Old Delhi and New Delhi. Ancient houses and narrow streets of old Tashkent reminded one that this was a city designed 500 years ago not for cars but for horses and camels. We saw parts of the old city being broken down to make room for new blocks of apartment houses. In old Tashkent we also saw small early morning bazaars where milk and vegetables and fodder were being sold, very much like the bazaars that one sees in the Punjab towns. There were long queues before the milk and vegetable shops, and it appeared that although there are State shops for milk and vegetables, the supply that people got from them was not sufficient and so in these small bazaars where farmers sell at a free market price people have to make most of their purchases.

49. Our plane took off at about 8 A.M. for Farghana. We saw from the air quite a few small farms, especially growing rice. This was in strange contrast with what we were told by authorities everywhere in the Soviet Union. Whenever we wanted to see some implements used by small farmers we were told that there were no small farms in U.S.S.R. as all had been converted into big farms and, therefore, there were no small implements. But there in Uzbekistan from air we could see some small farms. There appeared to be a good canal system throughout the area that we were flying over, mostly fed by the waters of the Amu Dariya and Sir Dariya. As we approached Farghana, the country first appeared to be desert and then hilly until a stage was reached when it was quite bleak and we could see below nothing but sand and stones interspersed here and there with very small and poor shepherd villages. After we crossed the hills we landed at Farghana at about 11 A.M. A number of local agricultural officers met us at the aerodrome. Farghana looked like a well watered valley surrounded by deserts and hills. Looking at the magnificent vines and apple trees we realised why Baber was so enamoured of Farghana. As a child he had felt the contrast between the green wealth of Farghana and the bleak deserts outside and that powerful impression he must have carried throughout his life.

Andhijan. 50. In the afternoon we reached Andhijan. Andhijan seemed to be a little sleepy town mostly agricultural, the main occupation of the people being work in Government offices and catering to the needs of the agricultural population of the surrounding territory or work in the small silk industry of the locality.

51. We spent almost the whole of the day examining the irrigation system of Andhijan and had a nice lunch on the banks of the Great Farghana Canal and listened to the

story as to how these canals were built. It was an inspiring story and seemed to be a precursor of what the Chinese have been doing for building the Huai river dam.

A night in a collective farm.

52. In the afternoon we went to one of the biggest collective farms of the area, the Kalinin collective farm where we were to spend the night. The Chairman of this farm was an old Mogul peasant who showed us round. The farm had magnificent buildings and the whole yard looked more like a factory than a farm. A large number of workers were working with all sorts of machines for cleaning, drying and packing cotton. The cotton fields stretched upto the horizon. It was harvesting time and quite a large number of girls were working in the field. There were also a large number of harvesting machines. There was a plane in the distance dusting the fields with Calcium Cyanide. The yield and quality of cotton were quite good. We were then taken to the place where the cattle were kept. The cattle that were shown to us were also of good quality. But then as we were coming out one of the members of our team peeped behind a fence and found that a large number of poor quality cattle had been herded together and hidden behind the fence away from our eyes. On the way we passed by several houses of collective farmers. They were the usual type of mud houses very common in Uzbekistan. We kept on wondering why in a collective farm which was so prosperous and had such magnificent buildings for collective farm offices etc., the houses of the farmers should be so poor.

53. It was at about 7 P.M. when we sat for dinner and after the usual speeches and toasts we asked the Chairman of the collective farm to tell us the story of his life. The Chairman, Mr. Ashraf, did not require much persuading and we were also rather anxious that his attention should be more engaged in recounting stories rather than feeding us because the amount of food that he had put on the table was somewhat frightening for any one except a Mogul farmer. It appeared that Ashraf was a youngman of 24 when in 1926 he organised the farmers of his village into a co-operative farm. Later on, about 12 co-operative farms of the locality were combined into the collective farm that we saw—the Kalinin collective farm. Ashraf kept on saying that we would not be able to understand what was the great contrast in the standard of living which he had in 1926 and which he had now. Life was much richer and much fuller now. We asked him what was the fate of the landlords. He said that most of the landlords who owned more than 200 hectares had left the area. Only one or two had remained. They were taken in as members in neighbouring collective farms. Originally there were 100 families. Now they had as many as 600 families in the collective farm. Compared to the average wage of 4 to 5 roubles per day in 1929, the present wage was 21 roubles cash and 4 kilogrammes of wheat plus a large amount of vegetables per labour day unit. Besides this, the col-

lective farm had an undivided fund of 8 million roubles. We asked Ashraf why was it that the public houses of the farm were so magnificent but the houses in which the farmers lived were so poor. He said at first that they were not really so miserable as they looked from outside. In fact these mud houses suited the climate of Uzbekistan very well. But later on he gave up his defensive attitude and admitted that farmers' houses could be much better than what they were. He said that neither the State nor the collective farm had been able to spend so far anything for improvement of rural houses. All their attention was concentrated on increasing production and the farmers themselves also spent their additional income more on consumption goods like clothes and shoes and cycles and did not have enough savings which they could spare for building decent houses. We realised that in a country where a pair of shoes costs 300 to 500 roubles, a shirt 150 roubles and a suit 1,000 to 1,500 roubles, it was not easy for a farmer to save enough money to build a decent house. We also appreciated that first priority in a relatively poor country like Russia was to increase production and to reconstruct war damages and that the State was not perhaps very wrong when it give a very low priority to rural housing. But we could not understand why the Soviet State with all its power and means for propaganda could not persuade the Uzbek farmer to build his mud houses following improved designs.

54. Ashraf then described to us the difficulties that he had faced in building up first the co-operative society and afterwards the collective farm. He described how he had to win over a recalcitrant minority, how when crops failed for two successive seasons he had to strain himself to the utmost to keep his collective farm going, and how during the War when supplies of fertilizers failed he had to improvise to keep his production up. He also described to us how the collective farm had become a closely-knit joint family. The 600 families who lived in the collective farm married mostly amongst themselves. They were now not only brothers in a common task but were also blood relations and there was a new loyalty for the collective farm which resembled the loyalty that we had in India in the past for the joint family. Ashraf said that formerly most of the experts, doctors and teachers of the collective farm were outsiders, now they were sons and daughters of the collective farmers themselves who had got education in Tashkent and had come back to take up these jobs. He mentioned that one of the sons of a collective farmer had become a Doctor of Science of the Tashkent University and was working there in the Research Institute and 12 had graduated in various subjects. There was a tinge of pride in his voice when he was recounting all this, and if appeared that the collective farm was more near to him than the communist society or the Russian nation. This led us to wonder whether, while at the opera we saw Soviet propagandists trying to undermine the influence of the family

and especially that of the parents and link the individual directly to the State short-circuiting the family, there was not a new development in the collective farm itself. Was not the collective farm developing into a huge joint family which commanded the first loyalty of its members and which might intervene in future between the individual and the State? It is very difficult to make predictions in things of this character. But we wondered whether Harold Laski's dream of a pluralistic society had not already had an embryo in the collective farm and whether the collective farm was not the anti-thesis which the monolithic Socialist State of Russia was generating within itself.

55. After dinner we were led to the Opera House of the collective farm where the boys and girls of the farm gave a performance in our honour. The Headmaster of the local School was the Director and he was a pretty good director too. Some of the songs and skits that were put on the stage were very good and would do credit to any amateur college dramatic society in this country. One girl in particular did a few comic skits which we all thought was really first class. All the stories, however, centred round cotton and life in a collective farm, the foils and foibles of a collective farm boy and a girl or the utilitarian attitude of a crusty collective farmer. At the end of the performance the Chairman of the collective farm made an elaborate speech thanking the Indian visitors and hoping that the friendship of Soviet Union and India would help preserve the peace of the World.

An Uzbek Farm Servant.

56. Our beds were made in a dormitory in the office building of the collective farm. There were clean new bed sheets and pillows made of Farghana silk. We realised that we had put the collective farm to considerable expenditure by agreeing to spend the night there. But we were not very sorry because the collective farm was spending so much money in various ways that a few more new beds would be a welcome addition at least for future guests of the farm. When we were about to retire and Ashraf and the Russian officers had left, an old Uzbek servant entered the room to ask us whether we had any last minute requirements. He was an old man of 65, a very simple and friendly type and did not show any inclination to hurry up possibly because this was the first group of Indians that he had ever met. His curiosity was even more than ours. He asked us a number of questions about the land of Hind and was very willing to give replies to our questions. He seemed to be a devout Muslim and was sorry that the modern young men and women did not have any faith in religion. He went to the mosque every Friday and had the opportunity of going to Mecca two years back. He was very enthusiastic about his visit to Mecca because he said that only 21 people were able to go that year. To our question as to whether he was happier now than he was 37 years back, his reply was quizzical. He said he was a servant ~~37~~ years ago and he

was a servant also now. Formerly he called his employer master. Now he called his employer Chairman. He gets no doubt a higher pay now but things also cost much more. On the whole perhaps he is somewhat better off but he is also older. And then he concluded that Allah is Great and Allah has been very kind to him. With this diplomatic reply he took our leave. Throughout the night we found people working outside with the music of radiogram and powerful electric lamps. Our sleep, therefore, could not be very sound until 3 o'clock in the morning when the music stopped and people went to bed, so that when we woke up at the loud knocking at the door by Ashraf it was 8-30 A.M. We were told that we should hurry because the plane would be leaving soon.

Return to Moscow.

57. The return trip to Tashkent was uneventful. The whole of the 27th September we spent with the Planning Commission of the Uzbek Republic, the organisation of which we have explained in detail elsewhere. We also visited a textile mill and an agricultural machine factory. We started for Moscow on the 27th night again at 3 in the morning. The Deputy Minister for Agriculture came to see us off at the airport even at such an unearthly hour. The next 6 days that we were in Moscow were spent mostly in discussions with the officials of various Ministries and Research Institutes. The results of these discussions have been recorded elsewhere.

The Kremlin.

58. We took, however, some time off to visit the Mausoleum of Lenin and Stalin as well as the Kremlin. The Kremlin is an old fort-*cum*-palace built by the Tsars and is slightly larger than the Red Fort in Delhi. But whereas from outside the Red Fort looks much more handsome than the Kremlin, the Kremlin has many more palatial and impressive buildings than the Red Fort has. The main palace in the Kremlin is the Headquarters of the Soviet Government and is heavily guarded. The part which we were shown was the Museum where all the jewellery and other souvenirs of the Tsars are being kept. There is no doubt that it has one of the world's best collections. For instance, the collection of jewellery at the Kremlin is much bigger than the collection at the Tower of London. We were also shown an old Church within the Kremlin where the Tsars used to pray. It has beautiful frescoes which are being carefully preserved by the Soviet authorities.

The Lenin Stalin Mausoleum.

59. The Mausoleum of Lenin and Stalin is a pyramid-like structure right in the centre of the Red Square in front of the Kremlin. Long queues of delegations of various countries were waiting outside to lay wreaths on the Mausoleum. As the placing of wreaths at Rajghat is one of the musts for foreign delegations in India, similarly placing wreaths at the Mausoleum of Lenin and Stalin is one of the musts in Moscow. But the thing is done in a much more formal manner in Moscow than in Delhi. The

whole delegation has to stand in a line and the leaders have to carry the wreath towards the Mausoleum and to stand near the gate of the Mausoleum, then enter the Mausoleum and go round the tabernacle in which the bodies of the two Soviet leaders are preserved, much in the same manner as in a Hindu temple pilgrims have to go round the deity. The bodies of Lenin and Stalin are kept inside the Mausoleum in an underground vault covered in glass. We had expected to see only coffins. But we were surprised to see that the dead bodies were laid down side by side in two beds as if the two leaders were asleep. The most amazing thing was that even the body of Lenin who had died 30 years back looked completely fresh. There was no deterioration whatsoever. It appeared as if the two men had just slept. Even the colour of the cheeks was rosy and there was no paleness whatsoever in the colour of the skin. We all wondered how these dead bodies could be preserved for decades without any deterioration. If there was some enbalming done then there would be certainly some deterioration. At least the colour of the skin would be less natural. Someone said that the bodies were preserved at a very low temperature and in a vacuum. But the vacuum must have been disturbed when the body of Stalin was put beside the body of Lenin. Anyway the chemists and other scientists who were in our delegation were not able to give any satisfactory answer. On seeing the bodies of Lenin and Stalin in this pyramid like Mausoleum we were reminded of the pyramids and the mummies of old Pharaos of Egypt which we had seen in Cairo. We wondered whether the similarity was a mere coincidence or whether it had a deeper significance.

60. The day before our departure from Moscow *i.e.* on the 4th October, the Government of U.S.S.R. gave a very big banquet in our honour. All the top men of the Government who were present at our Ambassador's dinner were present at this banquet also. This was quite a glittering gathering—a gathering of politicians and artistes, of well dressed men and beautiful women. After the drinks and before the dinner a number of artistes of the Bolshoi Theatre entertained us with songs and music. There was no doubt that the Soviet artistes were amongst the very best in the World. But the most unexpected thing was that one of the artistes after singing a few folk songs from Ukraine and Tashkent suddenly started singing the Hindi song of Harindra Chattopadhyaya "Suriya Asth Ho Gaya" and gave quite a creditable rendering of it.

CHAPTER III

GENERAL IMPRESSIONS OF U.S.S.R.

U.S.S.R. is a vast country—about 7 times as large as India—and it is even more difficult to generalise about her than it is for India, especially after only a month's tour. Still we feel that it would be useful to record our general impressions about the country, the regime and the economy for whatever it is worth. It may help to a small extent to give a balanced perspective of men and things in a country about which one gets so many conflicting reports.

Russian Geography.

2. The one single factor which cannot but leave an overwhelming impression on a foreign visitor is the Russian geography. The Soviet Union forms the largest contiguous land area ruled by one Government. It is 11,000 kilometres long from east to west and 4,500 kilometres broad from north to south. An appreciable part of the country lies within the Arctic circle. Most of the rivers run north and south and there are very few breaks in the coast line. Thousands of miles of forests and deserts separate important centres of industry and agriculture. Communication is an extremely difficult problem. One cannot help feeling that forms of economic organisation which would suit a country like this have necessarily to be different from those which are suitable for smaller and more compact countries.

The Climate.

3. The Russian climate ranges from the arctic to the sub-tropical, the great bulk of the country having a continental climate with very cold and long winters and relatively warm but short summers. Over much of the Soviet Union the climate is not favourable for agriculture. In fact the total arable land constitutes only 10 per cent. of the total geographical area in the Soviet Union as compared to 45 per cent. in India. Even over large parts of the arable land, the farmer has to fight a grim battle with nature and instances are only too common when a severe frost or a drought deprives him completely of the fruits of his hard work. The northern Tundra area is nearly frozen throughout the year and is suitable only for raising reindeer, fishing and hunting. The Taiga area south of the Tundra has some settled agriculture but it is more important for its mineral resources. It is the Steppe area in the extreme south which has some of the richest soils in the World where conditions are most favourable for agriculture. In Central Asia, in the area around Georgia and in the Amu river valley there are relatively long periods of warmth and semi-tropical crops flourish wherever there is enough supply of water.

Russian Agricultural conditions very different from India.

4. Our general impression was that climatic conditions in U.S.S.R. are so very different that the experience of Russians in the field of agriculture is not likely to be of much direct value to us. Their main agricultural problem is the problem of the long winter and that is in sharp contrast with the short winter that we have here. The scientists in U.S.S.R. themselves agree that developments in their country like vernalisation are not likely to be of any use to India. The crop yields in U.S.S.R. are also not comparable to those in India. For instance the Russians get only one crop every year in some area and in other areas only one crop every two years as against two or three crops which we get in India every year from the same field. Thus it would not be correct on our part to compare the yield of, say, wheat per acre in U.S.S.R. with yield of wheat per acre in India. Another important difference is that while we have an acute shortage of land and a surplus of population, U.S.S.R. has an abundance of land and a shortage of workers. That is why the Russians are going out more and more for extensive cultivation, larger and larger collective farms and greater and greater mechanisation. On the other hand in our country we have of necessity to use more and more intensive form of cultivation. Thus our general impression is that so far as agriculture is concerned we can perhaps learn more from countries like Italy and Japan than from U.S.S.R. This does not mean that Russian agriculture is inefficient. In the context of their own economic conditions they are making quite good progress in the field of agriculture especially after the change of policy in 1953. But their success is greater in fields like grain or cotton production where large-scale operation is feasible rather than in livestock production where individual care and attention are indispensable. They are, however, quite conscious of these short-comings and are making lately strenuous efforts to overcome them through research and through the development of a system of individual responsibility and incentive within the broad frame-work of the collective farm system.

Conquest of Nature and Development of new areas.

5. Recent advances in technology are,. however, fast changing the Russian scene. Nature is being brought more and more under the control of man. Poor soils are being transformed by the use of fertilisers, drought is being conquered by irrigation and scientific breeding has led to the introduction of new varieties of plants and animals which are able to withstand the rigours of the climate. But it is technological advances in the field of transport, industry and mining even more than in the field of agriculture which have helped to change the Russian scene most. Areas which were hitherto uninhabited Tundra or desert land, are now humming with human activities because valuable minerals have been discovered and flourishing industries have been set up. Fast air services which hop over inaccessible forests and deserts now make travel

from Moscow to towns in Siberia and Central Asia a matter of only a few hours as compared to weeks which was the rule even a few years back. As a result the Russians are now finding it possible to effect considerable planned movement of population from European Russia, which is relatively more crowded and also militarily more vulnerable, to Siberia and Central Asia. Like our Andamans, Siberia is no longer the dreaded place it used to be in the past.

6. Many of the Russians whom we met had spent two or three years in one or other of the new industrial or mining townships which are being set up in Siberia. The Russians have, no doubt, rebuilt most of their factories in European Russia which were destroyed during the War. But most of these are civilian industries and appear to have been rebuilt more from economic and employment considerations rather than military ones and would perhaps rank amongst "expendable" items in case of War. There are relatively few completely new plants set up in European Russia after the War. Many factories that we saw in European Russia contained a large proportion of old equipment and machinery. By contrast the factories in Uzbekistan contained more modern machinery. We were told by some Russian Officials that the factories in Siberia and in the Urals were of even more modern type.

Technical efficiency.

7. As regards the economic strength of U.S.S.R. our general impression is that technically that country is somewhat behind Germany or U.S.A. but not very much behind. Roughly speaking, we would say that technically U.S.S.R. is 6 to 7 years behind Western Germany or U.S.A. But factories in U.S.S.R. sometimes give a general impression of much lower technical efficiency than is really the case because they have a practice of continuing to use obsolete machinery much longer than it is done in other countries. It seems that it is only "depreciation" and not "obsolescence" which is mainly taken into consideration by the Russians in the matter of replacing old machinery by new. Their main emphasis today is on the volume of production and finish is really no consideration with them as they do not have to produce for a competitive market.

8. Although U.S.S.R. may be technically somewhat backward compared to Western Europe, this should not lead us to under-estimate her real industrial strength. We must not forget that whatever the Russians are producing, they are doing on a mass scale. A large number of second grade machines may sometimes represent greater industrial strength than a smaller number of first grade machines, especially if the former happen to be in a non-competitive economy. The Russians are not producing so many varieties of each item as are produced in Western countries. They are concentrating on a few items only and producing them on a very large scale. Moreover, they have a practice of giving higher priority to a limited number of items and giving lower priority to others. Those

few items to which they give high priority are being produced really efficiently whereas the quality of the other items may be often considerably below standard. But the Russian planners who have the difficult task of satisfying a number of national demands with limited resources do not mind that.

9. From what we saw in Czechoslovakia, Poland and U.S.S.R. we got the impression that the industries of these countries have been integrated in such a manner that the factories in Czechoslovakia and Eastern Germany are concentrated on producing special types of machines and machine tools which it is difficult to manufacture in U.S.S.R. and these are supplied mostly to U.S.S.R. U.S.S.R. is concentrating mostly on mass production of other machinery which do not require so much technical skill as the above and these are supplied to countries like Poland, Bulgaria, Rumania and China. The boycott of U.S.S.R. by U.S.A. and other western powers during the last eight years had no doubt at first retarded her economic progress to a certain extent. But U.S.S.R. tried to overcome initial difficulties by making copies on a large scale of the Swiss, German and American equipments which they possessed. One result of this boycott has been that U.S.S.R. is today industrially much stronger and more self-sufficient than she was eight years back. The technical skill of Eastern Germany and Czechoslovakia together with the immense natural resources, man power and market of U.S.S.R. and China is fast converting the Communist bloc of countries into quite a formidable and self-sufficient economic zone. But one gets the impression that the Russians are doing better in applying known techniques on a larger scale rather than inventing new techniques. They are, however, quite conscious of this weakness and are currently laying great stress on research. They are spending huge amounts on research and their scientists and technicians are amongst the most highly paid officials in the country.

The political scene.

10. As regards the political set-up there is no doubt that it is very different from what we are used to in India. It is also true that no criticism of the regime is tolerated. But it will be wrong to say that no criticism of any kind whatsoever is permitted in U.S.S.R. Provided one does not say anything against the regime, one is quite free to criticise one's colleagues or bosses and in such criticism the Russians participate with a good deal of enthusiasm. Russian newspapers are mostly views papers and we must confess that the Pravda was a disappointment to some of us. We never imagined that such a famous newspaper would be just a four-page sheet which contained mostly editorial comments, articles and speeches, a little bit of home news and sports news and very little of foreign news. But we must also say that we found much less of fear amongst the Russian people than some of us had expected.

It seemed that in U.S.S.R. after 37 years of communist rule the regime has mellowed down appreciably while in a country like Czechoslovakia where communist rule has been hardly six years old and has yet to contend with opposition from certain social elements, the regime is much more harsh. Even during our short stay we could sense some discontent amongst the people of Poland and Czechoslovakia against the communist regime. But we have no doubt in our mind that in U.S.S.R. the people are solidly behind their Government. One reason is that people who knew life under the other economic systems are no longer there in U.S.S.R. after 37 years of communist rule. The new generations which have come up do not know anything of the outside world except its bad features about which considerable volume of propaganda literature is available in the country. They think that theirs is the best of all worlds and whatever difficulties they may have are due firstly to the War and secondly to the hostility of the capitalist World which is bent on crushing the communist regime in U.S.S.R. If any one imagines that there may be in the near future any mass upheaval in U.S.S.R. he will be making a serious mistake. Of course, we would not rule out palace rebellions and struggle for power among various caucuses. In fact in a country where there is a single party system and no open parliamentary opposition is permitted and where the principle of legitimate (or constitutional) succession to power has not yet been properly established, caucuses are inevitable in the party, civil services, armed forces, technical cadres and trade unions and in the absence of a strong national leader there is bound to be frequent struggle for power among these caucuses and periodical reshuffle of Government through behind-the-scene activities and *coups*. But we would rule out any mass upheaval at least in the near future. In fact there are not many countries where the people are so solidly behind the regime and the opposition of the Western nations has helped to unite the Russian people all the more.

The average Russian.

11. We found amongst people in Western Europe a wishful thinking that the Russians are a very discontented, unhappy and unsmiling people. But that is far from the truth. Certainly the Russian cities, like Indian cities, are not as gay as the cities of Western Europe and U.S.A. one does not see so many shop lights and neon signs, dance halls and cabarets, swimming pools and fashion parades. The luxuries and excitements of Western Society are certainy lacking there. People are somewhat drably dressed. Women use very little of cosmetics. The main diversions of the people are ballets and operas and football games. But they do not certainly appear to be unhappy. By comparison we found people in Czechoslovakia somewhat less happy. We noted, however, considerable regional differences in U.S.S.R. itself. People in Stalingrad and Tashkent appeared to be much more gay than people in Moscow.

Technocrats and Bureaucrats.

12. Another difference that we noticed between U.S.S.R. and Poland and Czechoslovakia is that while the latter two countries are ruled by Communist party bosses and even in factories and farms topmen are Communist party representatives, U.S.S.R. today is ruled not so much by the Communist party as by Technocrats and Bureaucrats. During the last 30 years there has grown up in U.S.S.R. a very large class of officials—officials of the army, officials of the factories, officials of the Government and officials of the trade union. It is this official class which is today the real ruler of U.S.S.R. All the Deputy Ministers are promoted officials or technicians. About half the Cabinet Ministers are promoted officials. The top men in factories or in the army or in most Government departments in U.S.S.R. are no longer Commissars. With the death of Stalin the power of the official class has increased considerably and the impact of this can be seen on the character of the Russian Government. There are definite indications that some of the old Communist ideals are being watered down in the same way as the egalitarian ideals of early Christians were watered down after Christianity became a State religion. The senior officials in U.S.S.R. are quite prosperous looking people, in fact in some cases as prosperous looking and well dressed as businessmen in the West, and are very conscious of protocol. We found more formality in a Russian official's life and a greater emphasis on order of precedence in Russia than in most of the Western democracies. The amenities which average Russian Officers enjoy in office will cause envy in the hearts of most of their counterparts in India. The Managers of the Automobile Plant in Moscow and the Tractor Plant in Stalingrad have amenities which not many Western factory managers have and they talk to their subordinates with a self-confidence and authority which, we doubt, if any West European or American factory manager can afford to do these days.

Inequality of Earned Income.

13. We found that there is considerable inequality in U.S.S.R. at least so far as earned income goes. A housemaid in U.S.S.R. gets about 400 roubles, a nurse 500 to 600 roubles, a chauffer 800 to 1,000 roubles, a school master 900 to 1,100 roubles, a skilled workman in an automobile factory 1,000 to 1,500 roubles, a foreman 1,800 to 2,000 roubles, a superintendent in a Ministry about 2,500 roubles, a lecturer in a University 3,000 roubles, an Assistant Manager in a factory 3,500 roubles, a Factory Manager 6,000 to 10,000 roubles, a University Professor 6,000 roubles, a Head of a Division in a Ministry 6,000 roubles, a Director of a Research Laboratory 8,000 roubles, a Head of a Department in a Ministry 8,000 roubles, an Academician 10,000 roubles, a Deputy Minister 10,000 roubles, and a Cabinet Minister upto 25,000 roubles. The inequality will appear to be even greater when one considers that the maximum income-tax in U.S.S.R. is only 13 per cent. whereas in our country it is over 80 per cent.

14. It is true that besides cash remuneration, workers in U.S.S.R. get certain amenities *e.g.*, free or concessional transport to and board and lodging at holiday resorts once a year, sickness benefit, old age pension, free school education for children, etc. But that applies to all levels and does not reduce the basic inequality of income. The principle in U.S.S.R. seems to be that a man may be given higher income according to the quality and volume of work that he performs, and he is entitled to spend his income as he likes. If he wants to save, he can put his savings in a State Bank and get 2 or 3 per cent. interest. But he cannot invest his money in any private trade or industry so that, apart from the 2 or 3 per cent. interest that he can get from the Bank, he cannot have any unearned income except, of course, prizes and State lotteries. The choice before him is either to save and keep the money in the Bank and earn a small interest or to spend it for purchasing things. In the latter event he has to pay a very heavy turnover tax which is sometimes as high as 500 or 600 per cent. and most of the personal income is thus mopped up by the State and used for investment.

15. In U.S.S.R. the intellectual workers are usually better paid than manual workers, which is a sharp contrast with the situation in Poland and Czechoslovakia. For instance, a miner in U.S.S.R. gets about 1,500 roubles while a Professor gets about 6,000 roubles. But in Poland we found that a miner gets 1,500 zloties whereas a Professor gets only 1,000 to 1,500 zloties, a zloty being equal to a rouble. In Poland and Czechoslovakia there is a deliberate attempt to keep down the intellectual class, most of whom have a bourgeois origin. In U.S.S.R. the old bourgeois class is long dead and most of the present intellectual workers are *epigoni* who have either lost their affiliations with that class or have sprung from the proletarian class and this is probably the main reason why in U.S.S.R. they are much better treated. There are indications that Poland and Czechoslovakia are also likely to follow Russia in this respect once the transition period is over.

Condition of workers.

16. The standard of living of the average worker in U.S.S.R. is, of course, much higher than that of an Indian worker but it is not higher than that of a West European worker. In fact it is substantially lower than that of a Swedish or Swiss worker. The Russian worker enjoys no doubt benefits like sickness insurance, old age pension, free education for children, creches for infants, paid holidays, bonuses, etc., which usually impress visitors from India but these are now-a-days quite common in West European countries.

Piece rate of wages.

17. But U.S.S.R. has carried the incentive system of wage payment much farther than any other country. By time study and motion study every job is carefully analysed and an assessment made as to how much work a man

can do during an eight hour day and a basic wage is fixed for this norm. When the output of a man is higher or lower than the norm, he gets progressive premia or discounts. This system itself is a great incentive for an individual worker. But there are similar norms fixed with premia and discounts for each shop, each plant and so on. There is, thus, not only an individual incentive but also a collective incentive. Then there are periodical meetings in each shop or plant, etc., when the representatives of the workers, the management, and the local Communist party sit together and discuss methods of improving production, publicly honour the best workers and censure or even dismiss the laggards. While the Russians are quite generous in paying handsome bonuses, publishing photographs, awarding titles to good workers, they are also quite ruthless in dealing with the inefficient or the insubordinate. No *ca-canny* method, not to speak of strike, will be tolerated there for a day. There is, therefore, in U.S.S.R. a very big carrot in front of and a very big stick behind every individual worker, every shop, every plant, etc. This is called "Socialist emulation" which may not be quite to the liking of trade unions in non-communist countries which frown on piece rates in general. The Russians have introduced this piece rate or incentive system of wage payment not only in factories but also in farms, offices and even in ballets. We were told by a girl at the famous Bolshoi Theatre in Moscow that each performance is watched carefully by a group of judges who allot marks to each individual ballerina, on the basis of which bonuses and discounts are calculated. Thus each false step means the loss of a few copecks. It is, therefore, hardly surprising that the Russian ballet is so good. Although in the case of ballet, the system has produced such good results, in the field of production where norms could not be fixed with reference to quality and had to be fixed on the basis of output, it had, we were told, on many occasions led to a deterioration of quality. One of the greatest problems of the Russian management experts to-day is how to fix norms which would ensure both high output and high quality.

Shortage of male labour.

18. Another point which impressed us in particular is the apparent shortage of male labour both in farms and factories in U.S.S.R. and more so in Poland. The proportion of male to female labour would be as low as 1 to 2 or 3. We were surprised to find that female labour was being used even in hot shops *i.e.*, for works like tending furnaces, casting, forging, etc. In Poland factories were being guarded by female troops. On our asking why female labour was being used for such arduous work, we were told that there were equal rights for men and women and because these jobs fetched higher wages, therefore women actually volunteered for these jobs. But we feel that there must be other reasons too. For one thing quite a large number of men were either killed or incapacitated during

the War. Reclamation works in Siberia as well as setting up of large industries there may have necessitated the diversion of a large number of male labourers to that area. It is also possible that quite a high proportion of the male population may be in the defence services.

Prices very high.

19. The prices of most of the essential goods are very high in U.S.S.R. A pair of ordinary shoes which would cost 20 to 30 rupees in India would cost 300 to 500 roubles in U.S.S.R. We saw a pair of lady's shoes in a Department Store in Moscow, which was priced at 2,500 roubles. A suit which would cost Rs. 200 to 250 in India would cost 1,000 to 1,500 roubles in U.S.S.R. A shirt which would cost about Rs. 15 to 20 in India would cost about 150 roubles in U.S.S.R. A bicycle which would cost Rs. 200 in India would cost 620 roubles in U.S.S.R. Similarly a tie costs 14 to 36 roubles, a wrist watch 350 to 400 roubles, safety razor blades 3½ roubles for a packet of five, an art silk bed cover (single) 230 roubles, an art silk table cloth 130 roubles, a small lady's handbag 25 roubles and a bottle of perfume 35 to 135 roubles. Potatoes cost about half a rouble per kilogramme at State shops and 1 rouble per kilogramme in the open market. Milk costs about 2 roubles per litre in State shops and about 5 roubles in the open market. Eggs cost about 50 to 75 roubles per 100. Cars, gramophone records, bread and rent are, however, relatively cheaper. The Moscovitch Car which is like the old German Opel car costs about 7,000 roubles, a gramophone record costs about 3 roubles, an electric bulb about 2 to 3 roubles. A big loaf of bread costs about 0·8 roubles. Wheat costs about 1 to 2 roubles and rice 5 to 6 roubles per kilogramme. Rent of apartment including heating for 2 rooms costs 40 roubles, and for 3 rooms 60 roubles, electricity for two rooms 18 roubles in summer and 20 roubles in winter and for three rooms 25 roubles in summer and 30 roubles in winter, and gas costs 18 to 20 roubles per month.

Housing.

20. Housing is still a very serious problem in U.S.S.R. The State is concentrating all its attention on rebuilding War damaged areas and constructing new apartment houses in big cities and industrial centres. It is also encouraging private house building in the suburbs of big cities and in small towns and giving loans for the purpose. No private individual is, however, permitted to build a house within the municipal limits of Moscow and Leningrad or to build a house with more than 5 bed rooms or to own more than one house at the same place. The State owns all houses in Moscow and Leningrad. The new apartment houses built by the State seem to be fairly good but are very few compared to the demand and there is a long waiting list in places like Moscow and Leningrad. If one is high up in the list of the Russian equivalent of our Estate Office one can get a reasonably good flat at a cheap rent but otherwise one has to share an apartment with somebody else or to live in a shack. There are quite a large number of shacks around big cities in U.S.S.R. The

State is not doing anything worth mention for rural housing. The public buildings in collective farms, no doubt, look quite good. But the farm houses are poor compared not only to city houses in U.S.S.R. but also to farm houses in Poland and Czechoslovakia. Farmers' houses in Uzbekistan are mostly mud houses and almost look like similar houses in the Punjab. Some of the farmers, of course, have bicycles and even motor-cycles and also gramophones, radios, carpets, etc. and look quite prosperous otherwise. But their houses nevertheless seemed to be of a very poor standard.

Foreign exchange rate.

21. The Russians have deliberately kept the official rate of foreign exchange at a very high level. Officially 1 rouble is equal to 19 annas. But looking at the prices in India and in U.S.S.R. we do not think that we can put the real value of one rouble at anywhere more than 4 or 5 annas. But this high rate of foreign exchange does not affect their foreign trade. For, their foreign trade is handled entirely by State monopolies which sell their exports and purchase their imports at world prices irrespective of internal prices, the profit or loss being borne by the State. There is absolutely no relation between the internal prices and the prices at which the Russians carry on their foreign trade. The main reason for this artificially high foreign exchange rate is to insulate the economy from vagaries of world market forces.

Rate of Economic Progress

22. The rate of economic progress in post-war U.S.S.R. seemed to be somewhat lower than that in Western Germany but there is no doubt that it is appreciably higher when compared not only to most of the Asian countries but also to many countries of Western Europe. The real rate of progress is certainly higher than what it would appear to a lay observer looking at shop windows or people's clothes or even houses. The Russians have deliberately planned to concentrate on the production of capital goods rather than of consumer goods. And hence U.S.S.R. may not look very prosperous at first sight. But it would be wrong if that is taken as an evidence of a low rate of economic progress. We were told at the Planning Commission that U.S.S.R. is investing every year 20 per cent. of her national income. The Russian method of computing national income being different from the western method—this would mean that about 13 or 14 per cent. of the national income in western terms is being invested every year. Even this is considerably higher than the rate of investment, say, in a country like U.S.A. which is about 10 per cent. This must be reckoned as a remarkable achievement for a country which has gone through two World Wars, one civil war and a very costly economic struggle with the Kulaks in course of the last 37 years and has received practically no foreign assistance. She has been able to force the pace of investment to this extent only through a system of rigid controls. At the same time we were told that even with rigid planning one cannot

force the pace of development beyond a certain limit. For instance, in Poland the Government tried to force the rate of investment to 28 per cent. (according to the Russian method of computation) during the last two or three years but it was having an inhibiting effect on development and hence they decided to reduce it in 1954 to 19 per cent. Even in U.S.S.R., the Government have been obliged during the last two or three years to relax their controls to a certain extent because they found that a rigid system of controls, which aimed at too high a rate of investment in favour of capital goods compared to consumer goods, was acting like a boomerang and was impairing real economic development. Russians have, therefore, been obliged now to increase their production of consumer goods to a certain extent so as to provide some incentives to the workers. An emphasis on encouraging "material interestedness" for the worker is now the keynote of Russian economic policy, irrespective of any controversy that there may be over defence industries *versus* civilian industries. We felt that the pattern of investment and austerity that the Russians were obliged to have were largely conditioned by the international situation which Soviet Russia had to face during the earlier years of her economic development and need not be regarded as an essential condition of rapid economic development for countries which are more fortunately placed.

23. While the ordinary Russian is very proud of his country's achievements, people at higher levels, especially the top officials in the Ministries and in the Planning Commission were more modest about their claims. We have already mentioned Mr. Saburov's statement to us that U.S.S.R. had committed many mistakes in the past because she was charting out a new ground and there had to be many trials and errors and that it would be a good thing if India could profit from the mistakes of U.S.S.R. That certainly was not a very immodest statement and it was characteristic of most of the high officials in the Ministries and in the Planning Commission. While the people at the University and at some of the Research Institutes occasionally talked in terms of Marxist theory, the very able band of officials whom we met in the Planning Commission and the Agriculture Ministry rarely mentioned any ideology in the course of our long discussions. They talked like hardheaded practical men in any other country.

24. By and large the general impression that we got is that U.S.S.R. is today passing through a period of transformation. The process probably started during World War II when there was a large expansion of the armed forces and the technical services with a consequent weakening of the hold of the old communist guard, but it has been accelerated since Stalin's death. Socially and economically U.S.S.R. is now gradually moving away from the extreme left to which she had swung in 1917. This is

significant because during the same period the Western world has also been moving away, with occasional breaks, from the extreme right. Central control is now being visibly relaxed in U.S.S.R. while in the West there is an increasing participation by the State in economic life. The emphasis on the socialist principle "to each according to his ability" is leading to a new social stratification in U.S.S.R. There is now a growing official class in U.S.S.R. who have all the attributes of a middle class. On the other hand in the West the ranks of the middle class are being swelled both from the upper layers of the society and the proletariat. The internationalist who used to dream of world revolution has practically disappeared from the Russian scene. The average Russian is now a nationalist who is anxious to keep what he has got. When he thinks of other nations he thinks more in terms of balance of power rather than in terms of world revolution. As with every other revolution the *epigoni* of the Russian revolution are becoming less and less revolutionary and more and more conservative as years go by. It will be certainly wrong to read too much into these developments but one cannot help feeling that if there is a sufficiently long period of peace, the economic and social difference between Russia and the western world may narrow down to such an extent that much of the present incompatibility may very well disappear.

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CHAPTER IV

ADMINISTRATION AND PLANNING OF AGRICULTURE IN U.S.S.R.

Administrative structure in U.S.S.R.

Soviet Russia has a federal structure of Government. There is the Union Government at Moscow which is the Federal Government for all the constituent Republics of the Soviet Union. Below it there are 16 Union Republics each with its own legislature, Council of Ministers and Planning Commission. Each Union Republic is divided into a number of Oblasts (or Regions) and in a few cases they include also what are known as small autonomous Republics or Territories which for all practical purposes are equivalent to Oblasts. Each Oblast has its own administrative machinery as well as its planning machinery and comprises of a number of Raions (or districts) which again have their own planning as well as administrative machinery. Below the Raion the lowest administrative unit is the Town Soviet or the Village Soviet. But the lowest planning unit is the factory or the collective farm or the State farm. We propose to discuss below the structure of economic administration as also process of planning at each level from the Union Government downwards with special reference to agriculture. We would like to caution the reader, however, that a volume could be written on the subject and the present treatment is necessarily rather brief and even sketchy. Our objective is merely to provide a short background so that the reader can follow the rest of the report with understanding.

Supreme Soviet.

2. The supreme political as well as economic authority in the Soviet Union is the Supreme Soviet of U.S.S.R. which is equivalent to our Parliament. All major decisions regarding planning have to be approved by it. But in practice the Supreme Soviet is a decision recording body rather than a decision making body. For one thing there is only one political party permitted in the Soviet Union *viz.,* the Communist Party, and secondly the Supreme Soviet is too large a body to permit of any effective deliberations. Moreover, before election all the candidates have to be approved by the power that be, *i.e.,* the people who control the Communist Party and the Council of Ministers and hence there cannot be any effective open opposition. The real decision making bodies in the Soviet Union are the Council of Ministers and the Central Committee of the Communist Party. In practice it is the President of the Council of Ministers and the General Secretary of the Communist Party, who are the two key figures in the Soviet system of administration and who between themselves virtually rule the whole country.

Council of Ministers.

3. The Council of Ministers of U.S.S.R. has under it a number of Ministries *e.g.,* Agriculture, State Farms, Heavy Industries. Light Industries, Foreign Trade, Home Trade, Finance, Transport, Internal Affairs, Foreign Affairs, etc.

as also the Gosplan or the Planning Commission and the Central Statistical Organisation. The Chairman of the Planning Commission is a member of the Council of Ministers. In fact the present Chairman, Mr. Saburov, is one of the four Deputy Prime Ministers. The Director of the C.S O. holds office directly under the Council of Ministers, but is not its member. Formerly he was a member of the Planning Commission but recently there has been a complete separation between the C.S.O. and the Gosplan.

4. In the system of Soviet Economic Administration, the Gosplan, the various Economic Ministries and the C.S.O. are the key stones.

Planning Commission.

5. The Gosplan comprises of about 20 members, all of whom are whole-time officers. No member of the Gosplan is permitted to hold at the same time charge of any Ministry because it is felt that Gosplan being a co-ordinating body should be in a neutral position to take an overall view rather than the view of a particular Ministry. The members are specialists in different fields of the economy. While the Chairman of the Gosplan is a member of the Council of Ministers, the other members do not have ministerial rank or function. Besides the Chairman the Gosplan has 12 Deputy Chairmen each of whom controls 2 or 3 Divisions. The Gosplan is divided into a number of Branch or Subject Divisions and Functional Divisions. The Branch Divisions deal with different subjects of economic administration, *e.g.*, agriculture, iron and steel, fuel, electrification, supplies and deliveries of agricultural products, light industries, local and co-operative industries, transport, culture, health, etc., and are more or less counterparts of the various economic Ministries. The Functional Divisions seek to co-ordinate and scrutinise the proposals of various Branch Divisions from different economic points of view. The nature of their work will be apparent from their names, *e.g.*, Division of National Economic Plan, Division of National Perspective Plan, Division of Finance, Prices and Working Costs, Division of Capital Works, Division of Natural Resources, Division of Home Trade, Division of Foreign Trade, Division of Territorial Distribution of Productive Capacity, Division of Inspection and Use of Productive Capacity, Division of Balances and Plans of Supplies, Division for Distribution of Man-Power, Division for New Techniques, Council of Technical and Economic Experts, etc.

Council of Technical & Economic Experts.

6. The Council of Technical and Economic Experts of the Gosplan is a very interesting body. It seeks to maintain the closest liaison between the scientists on the one hand and the Planning Commission on the other. All its members except the President are part-time workers and are selected from front rank scientists in various fields. The Academy of Sciences as well as other Academies are represented on this body. The President of this Council

is a whole-time member of the Planning Commission. This Council submits periodically to the Gosplan analysis of various projects referred to it from time to time by the Gosplan. Gosplan also appoints special working groups of scientists from time to time on which are co-opted specialists from various scientific organisations as and when necessary.

7. The Union Planning Commission has a staff of about 1,000 technical experts. It is housed in a most imposing sky-scraper type building near the Revolution Square of Moscow. Since it is the repository of all secret information about the Soviet economy it is a very closely guarded place. Passes are checked at three or four centres before one is allowed to enter it.

Union Ministries.

8. The organisations of the various Union Ministries naturally vary according to their functions. There is nevertheless a broad similarity of structure. We propose to describe below the organisation of the Union Ministry of Agriculture as an illustration.

Ministry of Agriculture.

9. The Union Ministry of Agriculture has a total technical staff of about 1,800. It is headed by Cabinet Minister and 5 Deputy Ministers. In Soviet Russia Ministers are not necessarily politicians. In fact about half of the Cabinet Ministers and almost all the Deputy Ministers are promoted officials. The Deputy Ministers in particular are specialists in their respective fields.

Under the Minister for Agriculture there is a Council of nine comprising of the Minister, the five Deputy Ministers and three Heads of Departments. The Heads of Departments represented on the Council are the Head of the Economic and Planning Department, the Head of the Department of Supplies and the Head of the Department of Irrigation. The main Departments of the Ministry are as follows. The figures in brackets show the strength of the technical staff of each Department.

(1) Economic and Planning Department (240)
(2) Department of Supply (100).
(3) Department of Irrigation (80).
(4) Department of Animal Husbandry (80).
(5) Department of Machine Tractor Stations (300).
(6) Department of Extension and Scientific Research (225).
(7) Department of Electrification (25).
(8) Department of Forestry (130).
(9) Department of Agricultural Education (50).
(10) Department of Programme of Kolkhozes (25).
(11) Department of Agricultural Construction (80).
(12) Department of Land Utilization and Land Policy (20).

(13) Department of Finance (30).
(14) Department of Labour and Wages (15).
(15) Department of Accounting (15).
(16) Department of Surveys (100).
(17) Department of Law (8).
(18) Department of Inventories (23).
(19) Department of Insects and Pests (17).
(20) Department of Scientific Techniques (14).

10. It may be noted that the above staff represents the staff located in the Ministry only and does not include the staff of the subordinate offices. Where the Ministry has a very large subordinate office, for instance the Department for Control of Insects and Pests or the Department for Irrigation, the staff in the Ministry is necessarily small. On the other hand where there is no subordinate office, for instance, the Department of Machine Tractor Stations, the staff in the Ministry is necessarily large. The number of personnel shown against each Department should not, therefore, be taken as indicating the relative importance of each department or of the total number of persons working on these subjects. The Department of Scientific Techniques has only a staff of 14 in the Ministry but attached to it there is a Council comprising of 50 scientists from various Academies and Research Institutes.

Planning and Economic Department.

11. In order to give some idea of a particular Department we may take the Planning and Economic Department as an illustration. As there is the Planning and Economic Department for the Ministry as a whole, similarly there is a small unit for planning in each of the important functional Departments. For instance, the Animal Husbandry Department has a planning staff of 5 whereas the Department of Machine Tractor Stations has a planning staff of as many as 17. These Planning Units of the various Departments although they are located in different Departments are really under the control of the Planning and Economic Department. Out of the 240 people working in this Department about half work on planning for the Ministry as a whole and the other half work in the various Departments. This Department has three Divisions:—

(i) Planning,
(ii) Economics, and
(iii) Statistics and Methodology.

12. The Planning Division consists of the Planning Units in the various Departments plus a Co-ordination Unit in the Division itself. The Economic Division carries on investigations either directly or through various agencies in the States and Research Institutes into various problems of farm management and agricultural economics

e.g., cost of production, productivity of labour, specialisation in different types of Kolkhozes, etc. The Statistics Division deals with all statistical information which is required for the administrative work of the Ministry.

Statistics. 13. In Soviet Russia all agricultural statistics are divided into two parts: (i) Figures regarding operations *e.g.*, how much land has been sown, how much crop has been harvested, how much fertilizer has been distributed, how much milk has been produced, how much fodder is being consumed, etc., are operational statistics which are collected exclusively by the Statistical Organisation under the Ministry of Agriculture; (ii) Figures which give the over-all picture of the agricultural economy, *e.g.*, figures regarding overall acreage, production, cattle numbers, etc., which are collected once or twice a year or once in 5 or 10 years through censuses, are collected by the various collective farms, State farms, Machine Tractor Stations, etc., and one copy is sent to the Union Ministry of Agriculture and the other copy is sent to the C.S.O. While the Statistical Division of the Ministry of Agriculture uses these data for its administrative purposes, overall compilation and publication for the country as a whole is done by the C.S.O. The Central Statistical Organisation has a Council of Scientific Methodology of which the Head of the Planning and Economic Department of the Ministry of Agriculture is a member. The reason why publication of all statistical data is centralised in U.S.S.R. in the hands of the C.S.O. is that it enables the C.S.O. to advise the Planning Commission and the Council of Ministers independently, to keep a check over the work done by the various Ministries, but above all to keep the data secret. In U.S.S.R. a vast amount of statistical data is collected every year, but a very small proportion of it is published. Even what is published especially regarding production is more in terms of percentages of previous years rather than in absolute figures. The emphasis on secrecy is so great in U.S.S.R. that however best we tried we could not find out even such an innocuous information as the production of wheat in U.S.S.R. last year in spite of our asking questions at Agricultural Colleges, Agricultural Research Institutes, the Central Ministry of Agriculture and even the C.S.O. To our query why it is that while we in India do not mind publishing figures of production not only for wheat, but for all crops, not only for the whole country but also for States and Districts, in U.S.S.R. such a simple information should be considered as a State secret, a senior officer gave a reply which was very revealing. He said, "India has the sympathy of the World but U.S.S.R. unfortunately has the enmity of many countries. One never knows what information may be used by one's enemies for subversive activities". It appeared to us that one of the main reasons behind the centralisation of the publication of statistics in the hands of C.S.O. is this emphasis on secrecy. The C.S.O every year makes proposals to the

Government as to what figures should be published and it is only these which find the light of the day. On our questioning why they had this duplication by which same returns went to the C.S.O. as well as the Ministries, we were told that this was considered to be useful rather than a waste of effort, because one acted as the check on the other. In U.S.S.R. where the market mechanism is not there, the accuracy of statistics is very important for planning purposes because planning has to be done not only for the State as a whole but also for each small unit *e.g.*, the collective farm or the factory or the village or the district. Because the statistics collected are scrutinised simultaneously by two organisations—by the C.S.O. who have better knowledge of statistical methodology and by the Ministries and local authorities concerned, who have better knowledge of local conditions and also of the subject, the advantage is that one acts as a check on the other and there is mutual discussion for correcting any discrepancy which may occur. But it is the C.S.O. which is the final authority as to what figures should be accepted.

Central Statistical Organisation.

14. In this context it will be perhaps useful to say something about the organisation of the Central Statistical Organisation. The Russians consider that a strong Statistical Organisation is indispensable in any planned economy. In a *laissez-faire* economy where the pricing system in a free market generally adjusts supply and demand at various levels, over-all statistics are perhaps sufficient for economic administration. But in a completely socialistic economy where the guidance of the pricing system in a free market is absent, detailed statistics regarding supply and demand position at each level from the farm and the factory upwards are indispensable for the purpose of economic administration. Moreover, it is extremely important that these statistics should be very accurate. For even small mistakes in statistics may have disproportionate effect on economic decisions and may completely upset the economic calculations. That is why in U.S.S.R. the Government maintain a huge Central Statistical Organisation besides having independent statistical units in different administrative departments and the information collected by each is used to check the information collected by the others and a certain amount of duplication is considered to be desirable from this point of view.

15. The C.S.O. in U.S.S.R. has a total statistical staff of 36,000. Its Head Office is at Moscow, but it has sub-offices at the Republic Headquarters, at the Oblast Headquarters down to the Raion Headquarters. The staff in Moscow Headquarters is about 800 so far as the main Secretariat is concerned. Besides this there is a computing office where all machine computations are done. This office employs a staff of 1,000 and has a very large number of electronic machines. Besides this there is a special office for statistical publications which also employs about

500 people. At the top of the C.S.O. is a Director who holds office directly under the Council of Ministers. Until 1948 the C.S.O. was under the Planning Commission. But since 1948 it has been made an independent organisation because it was felt that this separation would enable the Council of Ministers to get an independent report from the C.S.O. on the work of the Planning Commission. The offices of the C.S.O. at the Republic and lower levels are all under direct administrative control of the Head Office in Moscow and are maintained from the Union Budget. The offices of the C.S.O. at the Republic and lower levels. however, are required to serve the Republic Governments and local authorities also. The office of the C.S.O. at the Republic Headquarters has usually a staff varying from 80 to 400 depending on the size of the Republic. Similarly the office of the C.S.O. at the Oblast Headquarters has a staff of 10 to 70 and at the Raion Headquarters of 2 to 5. Besides Raions, there are also representatives of C.S.O. located in important factories and cities. The lowest officer who is called a local Inspector, supervises the bookkeeping in the collective farms, State farms and factories. He is usually a man who has been given 3 years' training in a Statistical School. There are about 17 such schools for the training of local statistical inspectors in the whole of Soviet Russia. As has been explained above, statistical information from each factory or collective farm or State farm goes up in two parallel directions—one through the offices of the concerned Ministries and the other through the offices of the Central Statistical Organisation. At the lowest level, however, it is the local Inspector of the C.S.O. who supervises the collection and compilation of data by the Accountants of the collective farms and factories. The senior officers of the Ministries or of the C.S.O. at higher levels check these data in the light of other information which may be available to them. The C.S.O. in Moscow has to send to the Planning Commission and to the Ministries concerned:—

(a) Every day certain key data about production *e.g.*, steel, electrical energy, coal, oil, cotton textiles, transport, etc.

(b) Once every ten days details about the above.

(c) Once every month corrected data about the above and also data regarding number of cattle in Kolkhozes, the amount of milk produced in Kolkhozes and Sovkhozes.

(d) Once every six months area under crops, production of crops in Kolkhozes and Sovkhozes.

(e) Once every year number of cattle belonging to private individuals, production of small enterprises, etc.

16. The C.S.O. is at the service of all the Ministries concerned and supplies them with necessary data immediately on request. There is also very close liaison between the Ministries and the C.S.O., of which the Heads of the Economics and Statistics Departments of the important Ministries are members. The C.S.O. also gives advice on methodology to the Ministries in regard to statistics which are collected by them directly. As has been mentioned earlier all statistical publications are centralised in the C.S.O. and only a very small part of the total amount of statistics collected is published and for that purpose order of the Government has to be taken by the C.S.O. every time. The last publication giving figures of production of the crops in U.S.S.R. was brought out before the War. We were told by the Director of the C.S.O. that they are considering the desirability of bringing out a volume giving the latest figures of agricultural production. We are not sure, however, if the figures will be mere percentages or some absolute figures will be also published. The Director of the C.S.O. gave us, however, two interesting pieces of information. Firstly, the figures relating to production of agricultural crops will in future not refer to biological yields or the production as on the field but only to the volume of the surplus which has either been stored in the godowns of the collective farms or delivered to the State authorities. He explained that so far as the national economy is concerned it is not the production on the field which is important but the surplus which is available for the use of the nation. Moreover, the figure of production as on the field can never be as accurate as the figure of the surplus which is available to the nation and hence they are no longer collecting figures about the production on the field. Secondly, he said that they are not also collecting figures of production of crops on the personal allotments of the collective farmers. He said that these figures of production are very small and unimportant so far as the national economy is concerned. It would, therefore, appear that the Soviet agricultural statistics are rather incomplete judged even by our standards and they have cut the Gordian Knot of collecting statistics from small private allotments of farmers simply by not collecting the statistics at all. We were, however, told that complete enumeration is the method which is mostly used in U.S.S.R. They require this method because they have to plan for every field, every farm and every factory and sampling is not very useful for this purpose. Nor is it necessary because each factory and each collective farm has a very complete system of accounts and the question is merely of extracting these figures and compiling them at each successive higher level. In U.S.S.R. they are making use of sampling for finding out information about consumption pattern, family budgets, etc., and not for the estimation of production or area. They have got a sample of 22,000 urban families and 9,000 families of collective farms from which they collect regular information about family budgets.

Adminis-tration in the Republics.

17. The administrative system which obtains at the Union level is more or less repeated at the State level. For instance, at the Headquarters of the Republic of Uzbekistan which we had opportunity to study there is a Republic Soviet and then there is a Council of Ministers and a State Planning Commission and a State Statistical Organisation. The State Statistical Organisation is, no doubt, a part of the C.S.O. but the others are theoretically independent of the Centre. There is, however, considerable difference between theory and practice in Soviet Russia. In theory each Republic in U.S.S.R. is entirely independent. It can even secede from the Union if it likes. But in practice it is much more subordinate to the Union Government than any State in India. In the first place the Communist Party is a very strong controlling organisation in the hands of the Central Authorities. Secondly, most of the important sources of finance are controlled by the Union Government. The financial resources left to the States are so meagre that they are not in a position to look after anything except routine administration of law and order and items like health, culture, etc. For any big developmental project whether it is a big factory or a big irrigation scheme or a big agricultural scheme or a national road, the Union Government has to make necessary provisions. Moreover, the State plan has to be approved by the Union Government and is an integral part of the over-all plan of the country. This completes the subordination of the Republics to the Union Government.

The Planning Machinery at the Republic Headquarters in Uzbekistan.

18. In this context, it may be of interest to give some idea about the organisation of the Planning Commission and the Ministry of Agriculture of the Republic of Uzbekistan. The Uzbek Republic Planning Commission comprises of nine members nominated by the Government. The Chairman of the Planning Commission has the rank of a Minister, but he is not a member of the Council of Ministers. There are four Deputy Chairmen. All the members of the Planning Commission are full-time members. There are 17 main Departments in the Planning Commission *e.g.*, Department of Co-ordination, Department of Health and Culture, Department of Agriculture, Department of Planning and Construction of Buildings, Department of Supply of Materials and Equipment to Industry, Department of Supply of Shoes, Textiles, Wool, Kenaf and Silk, Department of Supply of Consumer Goods *e.g.*, fish, milk, canned goods, oil, condiments, tobacco, bread, wine, etc., Department of District Co-operative Societies, *e.g.*, potteries, furniture, agricultural implements for local use, knitting, special local textiles, etc. Department of Turn-over of Goods *e.g.*, shops, restaurants, dairies, etc., Department of Transport and Department of Finance, etc. There is a total staff of 120 at the Headquarters of the Planning Commission of the Uzbek Republic. The Planning Commission has 10 branches, 9 for the 9

Oblasts of the Republic and one for the autonomous Republic of Karakul Pakskaya which is a constituent part of the Uzbek Union Republic. The Planning Commission, at the Oblast level has a staff varying from 15 to 18 depending on the size of the Oblast. Below each Oblast there are about 32 Town Planning Commissions each having a staff varying from 3 to 15 and 130 District Planning Commissions each having a staff of 3 to 4. The officers of the Planning Commission at various levels are usually Graduates in Economics. But there are a few who have Agricultural or Engineering Degrees. The Agriculture Division of the Planning Commission has 4 Sections *e.g.*, Section on Cultivation, Section on Cattle Breeding, Section on Mechanisation, and Section on Collective Farm Economy. The Chief of the Agriculture Division is an agricultural officer of long experience with a high agriculture degree. The Chief of the Cultivation Unit is an agronomist. The Chief of the Cattle Breeding Unit is an animal husbandry expert. The Chief of the Mechanisation Unit is an engineer and the Chief of the Collective Farm Economy Unit is an economist.

Ministry of Agriculture in Uzbekistan.

19. The organisation of the Ministry of Agriculture of the Uzbek Republic is as follows:—The Ministry has a staff of 180 employees at Headquarters in addition to staff at the Oblast and at the Machine Tractor Stations. The staff at each Oblast headquarters is about 40 to 50 persons. In each Oblast there are about 20 to 25 Machine Tractor Stations which have a full complement of technical staff, sometimes even as high as 200 to 300 depending on the size of the Machine Tractor Station. Besides the Minister, there are five Deputy Ministers and a number of Heads of Departments. There is an Advisory Council of 9 to 11 members consisting of the Minister, the Deputy Ministers and the important Chiefs of Divisions. The main Divisions are Economics and Planning, Finance, Cotton, Grains, Fruits and Grapes, Machine Tractor Stations, Forests, Silk, etc. One typical Department *e.g.*, Machine Tractor Stations Department comprises of one Chief, one Deputy Chief and 4 Divisions *e.g.*, (i) Exploitation of Machines, (ii) Repairs, (iii) Finance and Planning and (iv) Accounting, each Division having a staff of 4 to 5 persons.

Planning Machinery at Oblast level.

20. At Stalingrad we had the opportunity of studying the Organisation of the Planning Commission and Agriculture Department at the Oblast level. The Planning Commission of the Stalingrad Oblast has a staff of 30 people all of whom are economists. Besides this each of the 43 Raions of the Stalingrad Oblast has a staff of 3 economists who work under the control of the Oblast Planning Commission of Stalingrad. The Oblast Planning Commission has one Chairman, one Deputy Chairman and Chiefs of Sections *e.g.*, Agriculture, State Farm, Industry, Health, Education, Fuel, etc. The Chief of the Agricultural Section has under him a staff of five economists.

Agriculture Department at Oblast level.

21. The Agriculture Department of the Stalingrad Oblast has a total staff of 150. There is a Chief of the Department and two Deputy Chiefs and there are the following Divisions with the staff of each indicated in brackets:—

Extension and Mechanisation (MTS) (27)
Animal Husbandry (12)
Irrigation and Water Control (6)
Forests (17)
Finance (7)
Planning and Economics (12)
Organisation of Kolkhozes (5)
Crop-Rotation and Land Utilization (7)
Training (7)
Secretariat (8)
Construction (8)
Five Zonal Divisions (10 each).

22. The Planning and Economics Division of the Oblast Agriculture Department works in close co-operation with the office of the Planning Commission at the Oblast level. Below the Oblast level there is a planning staff of 3 to 4 at each District level and planning staff for the Agriculture Department in each Machine Tractor Station. When it is remembered that in the Soviet Union there are altogether 94,000 collective farms, 9,000 Machine Tractor Stations, 4,700 State farms, about 4,000 Districts and 16 Republics, the total amount of technical and planning staff which is employed there would seem to be colossal even for agriculture alone. Besides the Ministry of Agriculture, there is the Ministry of State Farms at the Union level and the Ministry of Milk and Meat and Other Consumer Goods which also have similar large organisations and are concerned with agriculture. Besides, there is a Ministry of Supplies which is responsible for the distribution of grains. At the Republic level there is a Ministry of State Farms and a Ministry of Irrigation and a Ministry of Supplies, besides the Ministry of Agriculture and each of these has equally large staff as the Ministry of Agriculture described above. It should be also remembered that Uzbekistan which we gave above as an illustration is a relatively small Republic. The Russian Republic which is the largest has much bigger staff than the Uzbek Republic.

CHAPTER V

TECHNIQUE OF AGRICULTURAL PLANNING IN U.S.S.R.

Planning from the top.

1. Planning in U.S.S.R. is done both from the top downward and from the bottom upwards. (*Please see* chart at p. 53). Planning at the top is done by the Union Planning Commission in consultation with the various Union Ministries and is usually of two types. In the first place there is the long-term plan or what the Russians call "perspective plan". Secondly, there is the "current annual plan" which the Russians call concrete plan*. On the basis of the data collected by the C.S.O. and the various Ministries as also on the basis of other information available with the various organs of the Central Government, the Branch Divisions of the Planning Commission and the Planning Divisions of the various Economic Ministries proceed independently to work out certain tentative targets for the perspective plan. The perspective plan is usually for a period of five years, but in some cases, it may be for shorter or longer periods. For instance, some plans for electrification are for 10 or 15 years. But these are broken down to five year plans in order to fit in with the over-all five year picture. Simultaneous planning by the Branch Division of the Planning Commission and the Planning Division of the Ministry is not considered as wasteful duplication but is held to be useful in as much as it assists the checking of one set of ideas by another and also helps to bring out certain points which planning at only one place might overlook. Generally speaking, preliminary planning by the Branch Division of the Planning Commission is influenced more by over-all economic considerations, especially the availability of resources, while planning by the Planning Division of a technical Ministry is influenced more by technical considerations. If the former brings out clearly the requirements of the situation, the latter tends to emphasise the technical possibilities. This is followed by mutual consultation between these two Departments as a result of which the Branch Division of the Planning Commission suitably modifies its tentative plan. The plan is then examined by the various Functional Divisions of the Planning Commission and finally goes to the Co-ordination Division who try to fit in the various sectional plans into a comprehensive national plan. These papers are then placed before the members of the Plan-

Deliberate Duplication.

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*At the time of our visit both "perspective" and "current" planning used to be done in the same organisation. We understand that subsequently these two functions were made the responsibility of two different organisations. But that does not mean any fundamental change in the technique of planning.

ning Commission who try to match the requirements with technical possibilities and balance the demands of various sectors with the economic resources available to the nation. The draft perspective plan thus prepared is then put up to the Council of Ministers who give necessary directives to the Planning Commission. The draft perspective plan is then suitably amended by the Planning Commission in the light of these directives and sent to the Ministries concerned. This draft plan is kept as a secret document in the Ministries and is not sent further down. It just puts a rough picture before the Central Ministries as to the over-all economic position and sets certain tentative targets for the general guidance of the Ministries.

Planning from the bottom.

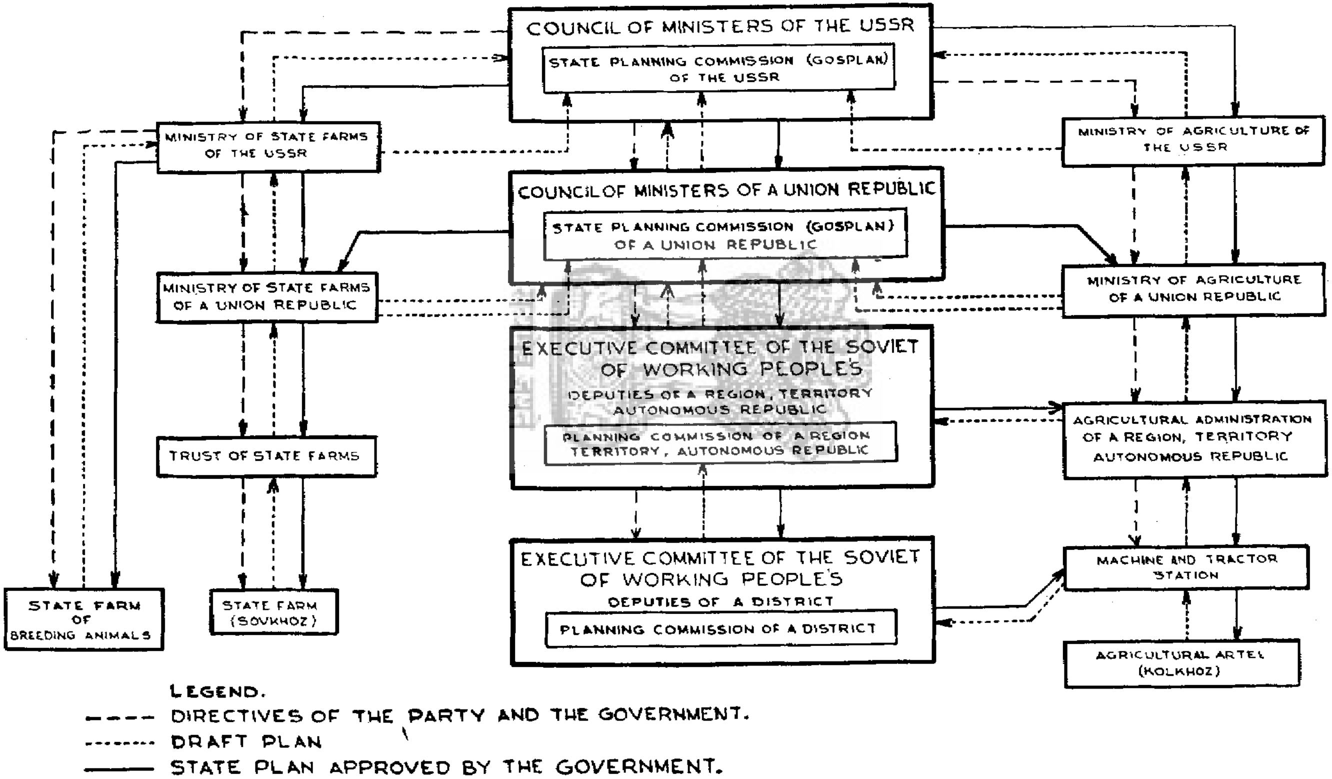
2. Simultaneously planning starts also from the bottom. In the light of its experience of past years and its judgment of future technical possibilities, each factory and each collective or State farm prepares a perspective plan of its own. Generally it concentrates its attention on technical possibilities rather than on over-all economic requirements except in regard to two or three very important items about which it gets some guidance from the announcements or speeches of the top leaders of the Government or the Communist Party as to what the most urgent national requirements are. These top leaders usually base their announcements on the preliminary assessments made by the Planning Commission as described above. The plans of the collective farms and the factories then come up to the Centre through two different channels—one through the Planning authorities at the District, Oblast and Republic levels right upto the Union Planning Commission and second through the Departmental authorities at the Oblast and the Republic levels right upto the Union Ministries concerned. At each stage there is appropriate examination from the economic and technical points of view and necessary co-ordination from the District, Oblast or Republic point of view. The Union Ministries then re-examine the tentative draft plan which was earlier prepared by the Planning Commission in the light of the plans received from the Republics.

Broad directives from above.

Matching of draft plans.

3. It is at this stage that final balancing of the technical possibilities, as set out in the plans submitted by the Republics, and the over-all requirements as assessed by the Planning Commission, is made. The general bias is to interfere as little as possible with the plans received from the Republics inasmuch as these are considered to be more realistic of the two. If, however, in the light of the over-all considerations as revealed by the draft plan prepared by the Planning Commission it is felt that the plans of the Republics should be changed to a certain extent, additions wherever possible are preferred to subtractions. Where subtraction is inevitable, it is not done in a *pro-rata* manner. Only such subtraction is made which would make the best possible use of the economic

SCHEME OF PASSING A PLAN OF AGRICULTURAL DEVELOPMENT IN THE U.S.S.R


COUNCIL OF MINISTERS OF THE USSR
STATE PLANNING COMMISSION (GOSPLAN) OF THE USSR
COUNCIL OF MINISTERS OF A UNION REPUBLIC
STATE PLANNING COMMISSION (GOSPLAN) OF A UNION REPUBLIC
EXECUTIVE COMMITTEE OF THE SOVIET OF WORKING PEOPLE'S DEPUTIES OF A REGION, TERRITORY AUTONOMOUS REPUBLIC
PLANNING COMMISSION OF A REGION TERRITORY, AUTONOMOUS REPUBLIC
EXECUTIVE COMMITTEE OF THE SOVIET OF WORKING PEOPLE'S DEPUTIES OF A DISTRICT
PLANNING COMMISSION OF A DISTRICT
MINISTRY OF STATE FARMS OF THE USSR
MINISTRY OF STATE FARMS OF A UNION REPUBLIC
TRUST OF STATE FARMS
STATE FARM OF BREEDING ANIMALS
STATE FARM (SOVKHOZ)
MINISTRY OF AGRICULTURE OF THE USSR
MINISTRY OF AGRICULTURE OF A UNION REPUBLIC
AGRICULTURAL ADMINISTRATION OF A REGION, TERRITORY AUTONOMOUS REPUBLIC
MACHINE AND TRACTOR STATION
AGRICULTURAL ARTEL (KOLKHOZ)
LEGEND.
---- DIRECTIVES OF THE PARTY AND THE GOVERNMENT.
-------- DRAFT PLAN
—— STATE PLAN APPROVED BY THE GOVERNMENT.

resources and which would mean the least interference with the plans of individual collective farms and factories. The Republic plans as modified by the Union Ministries are then sent to the Gosplan which then prepares a final draft plan. This plan is then put up to the Council of Ministers and to the Supreme Soviet for approval and becomes the perspective plan for the next five years. This plan is then published and forms the general guide for all organs of the Government and all Units of Production for the next five years.

Annual Plans.

4. But this perspective plan is merely a statement of targets and is not detailed enough. In the light of this perspective plan a concrete plan has to be framed every year. The procedure for the formulation of this annual plan which is called the current plan or concrete plan is more or less the same as that described above for the perspective plan. The main difference is that in the current plan the emphasis is more on planning from the bottom upwards. The formulation of the annual plan starts somewhere about June or July and is finalised round about November-December. Once this plan is approved by the Government it has the effect of a law and is binding on all concerned. It may be interesting here to describe the procedure for the planning in agriculture in some detail.

Planning in Agriculture.

5. The main purpose of the plan for agriculture is to establish the right proportion between agriculture and industry *i.e.*, between foodgrains and raw materials which are required by the non-agricultural consumers and the industrial products which are required for agriculture. Then there is the need for establishing the right proportion between different branches of agriculture *e.g.*, between crop economy and animal husbandry. This establishment of right proportion between different branches of agriculture depends upon the establishment of certain balances *e.g.*, the plans of tractors, plans of different agricultural machinery, plans of mineral fertilizers, plans of fodder, etc. In U.S.S.R. there are about 94,000 collective farms comprising of about 760 million hectares of land, 9,000 machine tractor stations having about 1 million tractors (in terms of 15 HP Units) and 276,000 combines and 4,700 State farms comprising about 70 million hectares of land. The collective farms and Machine Tractor Stations are supervised by the Union as well as Republic Ministries of Agriculture whereas 80 to 90 per cent. of the State farms are managed by the Union Ministry of State Farms, a small proportion by the Republic Ministries of State Farms and some by the different technical Ministries, especially the Ministry of Meat and Milk Production. Some industrial Ministries, especially those which operate in outlying districts *e.g.*, Ministry of Oil and Ministry of Coal have also a few small State farms of their own for special purposes, but their contribution to the total agricultural production of the country is very small. Agricultural planning, therefore, mainly involves planning by the Ministry of

Agriculture and the Ministry of State Farms and to a small extent by the Ministry of Meat and Milk Production. As the procedure followed by these Ministries is more or less the same, we shall explain it mainly in terms of the Ministry of Agriculture. Both the Ministry at the top and the farms at the bottom have to take into account a number of factors in the matter of formulation of the agricultural plan. These are:—

(a) Total cultivated area and area under different crops;

(b) Yield of different agricultural crops;

(c) The number of cattle and other animals;

(d) The productivity of each animal;

(e) Degree of mechanisation of works in the collective farms and State farms; and

(f) Materials and techniques needed to achieve the targets in view.

6. The first step is to analyse carefully the experience of preceding years and examine in particular how the deficiencies and short-comings noticed in the past can be eliminated. The next step is to take into consideration the achievements of progressive collective farms, Machine Tractor Stations and State farms in order to determine how far improved techniques and new machines may be utilised to increase the productivity. The Kolkhozes started their planning for 1955 as early as in June 1954. This planning is mainly done by the executive body of the Kolkhoz in consultation with the experts of the Local Machine Tractor Station. Sometimes a member of the Communist Party or an officer from the District Planning Commission is informally associated. The members of the Kolkhoz mainly base their plans on their past experience. The representatives of the Machine Tractor Stations help them in assessing the possibilities of technical improvement. The representatives of the Communist Party or of the District Planning Commission if they happen to be present emphasise some of the urgent national priorities in the light of which the production plan has to be determined. The ultimate authority for the preparation of the plan for the collective farm is, however, the Executive Committee of the Farm which has to get the approval of a general meeting of all the members of the collective farm before the plan can be finalized. This plan reached in 1954 the Oblast authority by the 3rd week of June which in its turn sent it to the Republic Agriculture Ministry and the Republic Planning Commission by the end of June. By the first week of July the Republic Planning Commission started examining these various plans and put up its final plan to the Republic Government on the 4th of August. Simultaneously copies of the plans of various Ministries reached the Union Ministries by the 1st week of July, who completed their own scrutiny by the 1st week of August. Between 15th August and 15th

September meetings were held in Moscow between the Union Planning Commission, the Republic Planning Commission and the Union Ministries for finalising the plan for 1955. In the light of these discussions the Union Planning Commission finalised their plan by the end of September and the Government gave a decision by the end of October. Necessary adjustments to be made in the draft plan in the light of the decisions of the Government were completed by the middle of November after which the revised plan was sent downwards to the Republics, Oblasts, Collective and State farms so that the collective farms might know definitely by the middle of December their plans for next year. In previous years preliminary targets for even the annual plans used to be fixed by the Gosplan sometime round about July. From 1954 onwards the Gosplan has decided not to fix these preliminary targets so far as current plans are concerned.

Decentralisation in Planning.

7. In fact there has been a sharp change in the nature and procedure for planning since 1953. The change has been mostly in favour of reducing central control, increasing local initiative, concentration of emphasis on broad features instead of details and reduction of red tape. It appears that during the last decade or so, the officers of the Planning Commission were trying to plan for greater and greater detail and increasing their zone of control. The control by the Central Planning Commission became so tight that each collective farm had to submit a detailed plan (*vide* Appendix II) in which particulars regarding acreage and production of different crops, the amount of fertilizers to be used, the amount of chemicals to be used, etc. had to be set down. The Central Planning Commission used to give directives even for individual collective farms as to what should be produced, how much should be produced and how exactly it should be disposed of and so on. Planning thus became not only too much of an interference with local initiative but matters came to such a pass that the Soviet authorities had to look up and take certain drastic actions. This is the story behind Mr. Khrushchev's famous speech in 1953 in which he roundly chastised officers of the Planning Commission who in their zeal to plan and control every detail of economic life had almost brought economic life itself to a stand-still. Mr. Khrushchev particularly mentioned by name two officers in charge of the Agriculture Division of the Planning Commission as examples of how not to plan. It appears that these two officers, who had entered the Planning Commission sometime in the thirties fresh from the University, had no practical experience of agriculture and were primarily theoreticians. After a few years' work in the Planning Commission itself in various capacities they were put in charge of the Agriculture Division and in their zeal for planning, guided by what were purely theoretical considerations, they tried to control agriculture in such detail that the progress of the Soviet agriculture was very adversely affected. There was an increasing volume of

criticism against this undue interference by the Planning Commission not only from the Agriculture Ministries of the Union and Republic Governments, but also from the collective farms and State farms. As a result both these officers were removed from their posts last year and the Soviet authorities took a decision to relax considerably the procedure for planning in agriculture and to depend as much as possible on local initiative for the development of Soviet agriculture.

Friction between Planning Commission and Ministries.

8. We discovered that there has been considerable friction from time to time between the Central Ministry of Agriculture and the Central Planning Commission over planning. The officials of the Planning Commission used to think that the agricultural officers were too narrow minded and did not have sufficient broad vision while the officers of the Agriculture Ministry felt that the officers of the Planning Commission were too theoretical and lacked a sense of reality. In fact whomsoever we talked with in the Agriculture Ministry pointed out with apparent satisfaction to the mistakes of the two officers referred to above and emphasised how necessary it was to ensure that there should be frequent inter-change between officials of the Planning Commission and the technical Ministries and that the Planning Commission should not be a body composed of mere theoreticians. They told us that in 1954 one officer of the Agriculture Division of the Planning Commission, the Head of the Economic and Planning Department of the Ministry of Agriculture and one agricultural officer from the Republic concerned were touring the country in order to get first hand information from the collective farms so as to make the plan for 1955 more realistic. People in the Planning Commission whom we questioned about the matter admitted that there was a tendency to plan too much in the past but they tried to explain that the recent change was a progressive measure made possible only by the development of technical cadres in the Kolkhozes. They said that in the past when the technical cadres in the collective farms were not so well trained, there was a need for central guidance even in the matter of details but now that the technical cadres in the collective farms had become better trained that need was no longer there and hence there had been a relaxation of controls in recent years.

Recent changes in Economic Policy.

9. There is no doubt, however, that the Planning Commisssion had erred on the side of carrying planning too far. But it also seems that there has been a definite change in economic policy in U.S.S.R. after Stalin's death. There seems to be relaxation in every sphere of economic life in recent years. Not only local authorities are being given greater initiative, there has been also a considerable emphasis on material interestedness or in other words "profit motive" for the farmer. Formerly, the collective farmer had to sell most of his products to the Government. Now his compulsory sales to the Government have been

cut down to a very small quantity and he is free to sell either to the Government or in the open market and in fact there are now quite a large number of collective farm markets where agricultural products are being sold openly at prices much higher than controlled prices. The new policy looks somewhat like the dual price policy which the Government of India adopted a few years back for sugar.

सत्यमेव जयते

CHAPTER VI

PLANNING OF COSTS, PRICES AND TRADE IN U.S.S.R.

1. In Soviet Russia the Planning Commission determines not only the production pattern, but also the costs and prices of the various products and how they should be distributed. A brief description of how this is done may not be out of place here.

2. By cost of production the Soviet authorities understand the expenses of a given enterprise in money terms for production of goods f.o.r. These expenses include:—

(a) Cost of raw and semi-manufactured materials which are used for production, fuel and energy. These items usually cover 2/3rd of the total cost of production:

(b) Expenses of organisation;

(c) Wages including contribution towards social insurance fund;

(d) All other expenses primarily connected with administration which are not included in the above;

(e) Amortisation in U.S.S.R. averages 2½ per cent. It is supposed to include full depreciation, but no obsolescence. Obsolescence is supposed to be allowed for in the planning for national economy as a whole and is borne by the State and not by any individual concerned.

3. In Soviet planning of cost of production, attention has to be paid to two main items:

(i) The determination of the expenditure for raw materials, amortisation and wages as explained above; and

(ii) The determination of expenditure which is involved in converting the goods into what is called commodities, in other words the cost of transport, storage and distribution of the finished product upto the stage of consumption.

While the expenses of production of a particular factory include not only cost of production of finished goods but cost of production of unfinished goods also, cost of production of a commodity includes the expenses which relate only to the finished goods produced during a given period and may include any cost incurred in previous periods which may have gone into the production of these finished goods. Besides the determination of the above two, the Planning authorities also try to secure progressive reduction of cost of production during the plan period. For this purpose they use an index of changes which take place in the average rate of cost during the plan period.

4. In order to establish the above index they use:—

(a) Material balances *i.e.*, data regarding material required and material used in the previous year;

(b) Amortisation Fund. In order to define this, they use the balance of capital funds where the increase of the average annual value of principal funds is given and the norm established by the Government for amortisation purposes;

(c) Wages. Care is taken that the expenses on this item correspond to the planned amount of wage fund for the plan period under consideration; and

(d) The figures regarding administration and other expenses for previous years and measures taken in the current plan period for the reduction of such expenses.

5. In U.S.S.R. the Union Planning Commission establishes figures for cost of production for about 20 items only *e.g.*, coal, oil, peat, electrical energy, timber, synthetics, rubber, sugar, etc. Costs of production of all other items are established by the Ministries concerned. Generally the Planning Commission establishes costs of only such items which are of national importance and in regard to which there is not much regional difference. There are some products of a very localised character *e.g.*, special types of local costumes, the costs and prices of which are fixed by local authorities.

Cost of joint products.

6. In regard to the allocation of costs of joint products a rule of thumb method is generally followed. Certain coefficients are determined on the basis of existing levels of prices and these are applied for allocating the total cost of production amongst the various joint products. Generally they concentrate on the principal product and try to assess its cost separately and assume that the costs of the by-products do not change and that there is no change in the technique of production either. They admit that this is not a very satisfactory method, but say that this is the only practical method which they have at the moment. They are gradually trying to make the technique more perfect.

Cost of Agricultural Products.

7. As regards agricultural products the plan for cost of production establishes costs only for State farms and Machine Tractor Stations. For the collective farms it is only the price which is fixed and not cost of production. Regarding State farms cost of production is established for different items *e.g.*, for 100 kilogrammes of grain or cotton

or beef or milk or wool, etc. For Machine Tractor Stations cost of production is defined separately for different items of operations *e.g.*, deep ploughing of one hectare of land, harvesting of one hectare of grain, etc. For transport the plan establishes the cost of one ton—kilometre. Accounts for all these as well as planned estimates of products and services are prepared and published separately.

8. To give an example, in determining the cost of production of a crop like wheat an attempt is made to determine separately two groups of expenses *e.g.*,

- (i) expenses which can be related directly to the produce *viz.*, seed, fertilizers, wages of State farm workers, fuel, etc.
- (ii) expenses which are of a general nature for the State farm as a whole *viz.*, salaries of State farm staff and other administrative expenses.

The first group of expenses is calculated on the basis of established norms provided in the plan. The second group of expenses is distributed between different products on the basis of established co-efficients. These co-efficients are established by experts separately for each farm.

Cost of Production of M. T. S.

9. The main items which enter into cost of production of Machine Tractor Stations are:—

- (i) fuel;
- (ii) capital repairs;
- (iii) wages;
- (iv) expenditure for current maintenance of machines; and
- (v) administrative and other expenses.

One difference between the determination of cost of production of State farms and of Machine Tractor Stations, is that while in the former amortisation is included, in the latter amortisation is excluded. Amortisation of the M.T.S. is borne by the State and not by the M.T.S. budget because the Government wants to help the collective farms by keeping the cost of service provided by M.T.S. as low as possible. Generally speaking, Ministries are supposed to establish plans separately for each State farm or M.T.S. But in practice they establish certain general plans for a number of homogenous zones. Within these zones, the Republic Ministries or Trusts establish plans for each Machine Tractor Station and State farm separately. In preparing these plans not only accounts of previous years are taken into consideration, but the achievements of the best State farms and Machine Tractor Stations in the zone are also kept in view.

Cost of Transport.

10. Plans for transport are established in terms of ton—kilometre. It is assumed that the cost of transport of one passenger for one kilometre is equal to transport of one

ton for one kilometre. The following items are taken into consideration:—

- (i) fuel;
- (ii) electrical energy;
- (iii) medium and current repairs;
- (iv) expenses connected with maintenance of railways, roads, water-ways, etc.;
- (v) wages; and
- (vi) administrative and other expenses.

Cost of turnover.

11. The next item in the cost of commodity production is the cost of circulation or of turnover. This cost is generally established in terms of copecks per rouble of retail turnover, as well as in percentages of the level of the previous year. In other words the plan says that during the current year the cost of turnover should be so much copecks per rouble of retail sales and there should be a reduction of so much percentage over the cost of previous year. The main elements which enter into the determination of cost of turnover are:—

- (i) wages;
- (ii) transport costs;
- (iii) interest for credit;
- (iv) maintenance of shops, etc. (including amortisation);
- (v) processes like packing, sorting in shops;
- (vi) losses in storage and transport by trading organisations themselves.

Fixation of Prices.

12. There are two types of prices in Soviet Russia—(i) State prices and (ii) Collective Farm market prices. The latter are not fixed by the State but are left to be determined by the forces of supply and demand in the market. But in as much as the bulk of the commodities traded in the country is sold at prices fixed by the State, the collective farm market prices are also indirectly influenced by the State prices. The State prices are of three main types:

- (a) State wholesale price,
- (b) State procurement price, and
- (c) State retail price.

Wholesale Prices.

13. The underlying object behind the fixation of wholesale prices by the State is to enable it to control the level of expenses in the national economy and to take measures for the reduction of the cost of production progressively. Thus the main basis of these prices is the cost of production which is supposed to reflect the condition of production in a particular industry. Except in the case of the timber industry, prices are fixed in such a way that the industries

make a profit. The general level of profit is about 3 to 5 per cent. of cost of production. But in the electrical and metallurgical industries the level of profit allowed is as much as 8 per cent. The timber industry generally works at a loss and has to be subsidized by the State. In fixing the structure of wholesale prices of different commodities an attempt is made to maintain a right proportion between the prices of different commodities. This establishment of a right proportion is a very important means for controlling industrial production and for exercising control over the economy as a whole. In U.S.S.R. the price mechanism is utilised firstly, to stimulate the use of less scarce raw materials in place of more scarce raw materials. For instance we were told that sometime back when there was a shortage of copper, the Government doubled the cost of copper and introduced premium for the use of substitute metals. This premium was based on copper prices. It is felt that even in a planned economy it is necessary to give such stimulus which encourages economy in the use of materials in certain desired directions. Secondly, the price mechanism is also used to facilitate rationalisation in the matter of transport of goods. For instance, prices of oil are fixed c.i.f. within particular zones so as to achieve economy in transport. Thirdly, the price mechanism is used to stimulate the utilisation of new techniques. For instance, when it was found that the use of steel rather than iron is better in the matter of concrete construction the relative prices of steel and iron were fixed in such a manner that people were encouraged to use more of steel and less of iron. While the above three considerations are generally borne in mind in determining the wholesale price, the level of profit is determined in such a way that a sufficient circulating fund can be built up for a particular enterprise. Normally the circulating fund consists of owned fund and credit fund. An attempt is made to see that the industry has sufficient owned fund to cover certain minimum amount of fuel, material, etc. Credit required for purposes like the payment of wages or for additional material, etc. is usually obtained from State Banks.

Margin of profit allowed.

Prices used for resource allocation.

14. The State procurement price is, however, determined on different considerations. It applies mainly to the products procured by the State on a compulsory basis from collective farms and is usually fixed by the State at a much lower rate than the cost of production. The underlying theory is that the State had made available a certain amount of land to the collective farm and is not collecting any rent for the same. The difference between the cost of production and the procurement price fixed by the State is supposed to cover a part of the rent for the land.

Procurement prices.

15. The State retail price at which a commodity is sold to consumers includes:—

(a) wholesale price,

Retail prices and turnover Tax.

(b) cost of retail distribution, and

(c) turnover tax.

The turnover tax is the main source of State revenue in Soviet Russia and varies widely from commodity to commodity. Where the State wants to encourage consumption, a turnover tax is fixed at a relatively lower level; where the State wants to discourage consumption, the turnover tax is fixed at a relatively higher level. The turnover tax is also the instrument by which the State forces everyone to contribute a certain amount for national investment. In the matter of fixing the turnover tax not only a careful study is made of the cost of production and distribution but also of the relative supply and demand position of various commodities.

16. What has been said above about the underlying principles of production and pricing of agricultural commodities applies broadly to other commodities also, although in the case of these commodities the administration is done by other Ministries, *e.g.*, Ministry of Light Industries, Ministry of Fuel, etc.

Distribution.

17. The distribution of commodities is mainly handled by the Ministry of Trade. Retail distribution in U.S.S.R. is carried on through three principal channels:—

(i) State retail trade net-work,
(ii) Co-operative retail trade net-work,

(iii) Collective farm market.

State Trading.

The first two constitute the organised sector of the trade and are directly influenced by Government planning. The collective farm market behaves more or less like the free market in non-socialist countries. But it is to a large extent influenced indirectly by State and co-operative trading which together constitute about 90 per cent. of the total volume of the trade in U.S.S.R. Of the total volume of State trading, the Ministry of Trade accounts for about 60 per cent. while 27 per cent. is handled by the system of workers' supplies in industrial enterprises. (This system was started during the Second World War when rationing was introduced and is mainly in vogue in areas where the geographical location of industries is such that a special organisation is necessary for supplying the day-to-day requirements of the workers. For instance, in the Donetz basin where a large number of industrial enterprises are concentrated, special arrangements for supplying the requirements of the workers have to be made.) The remaining 13 per cent. is covered by the net-work of other State organisations *e.g.*, Ministry of Health controls all drug stores, Ministry of Culture runs all book shops, Ministry of Communications controls all sales of stamps, etc.

Co-operative Trading.

18. Besides State trading, a fairly large volume of trade is carried on by the co-operative system. There are altogether 23,000 consumers' co-operatives in U.S.S.R. having

33 million members. In 1954 these co-operatives controlled over 226,000 State enterprises. Any person on attaining the age of 18 is eligible to become a member of a co-operative if he lives in the district. He has usually to pay a fee of the order of 150 to 200 roubles. Members of the co-operative elect their executive committee and chairman, the representatives of village co-operatives elect the District Union and the representatives of the District Unions in their turn elect the Regional Unions. The Regional Unions elect State Unions which in turn elect the Central Union.

19. Consumers' co-operatives get bulk of their supplies according to the State plan of consumer goods distribution either through an organisation of the Ministry of Trade or through other co-operative organisations. They also get supplies from local co-operative industries and occasionally make purchases in the collective farm markets. Co-operatives generally get their financial requirements partly from the subscription paid by their members and partly from ploughing back their profits. In case of need they get credit from the State also.

Planning of retail distribution.

20. In planning the retail distribution careful consideration is paid to the following:—

(a) The general volume of sales;

(b) The types of commodities to be sold;

(c) The construction of new shops and restaurants;

(d) Number of workers and employees in the trade net-work;

(e) The possibility of reducing the cost of distribution;

(f) The amount of profit accruing from trade and the percentage of this profit which is to be paid to the State.

21. In the matter of general planning of trade it is very important to establish a balance between national income and national expenditure during the plan period. Estimates are made of the principal items in national income *e.g.*,

(i) Wages—these constitute as much as 75 per cent. of the total national income;

(ii) Income in money terms of the rural population:—

  (a) Income received by the collective farmers for work done for the collective farm. Here income in cash only is taken into consideration and not income in kind,

  (b) Cash receipts of collective farm workers from the sale of their own private production;

(iii) Pensions;

(iv) Scholarships;

(v) Other receipts from State Organisations *e.g.*, the State lotteries, prizes, etc., credit given to individuals to build houses; and

(vi) Other sources of income not included in the above.

22. Only money income is taken into consideration because it is only that part of the income which is spent for distribution of money amongst various items *e.g.*, savings and expenses that is really pertinent for the planning of home trade. Money income is either spent or saved. Money expenditure can be of two types—

(i) Non-commodity expenses, and

(ii) Commodity expenses.

23. Non-commodity expenses include:—

(a) payment for different services *e.g.*, transport, rent, cinemas, theatres, etc.,

(b) taxes and payments to different social organisations, *e.g.*, income-tax, payments made to trade unions, Communist party, co-operative organisations, etc.,

(c) voluntary subscriptions, if any, to State loans, and

(d) changes in the volume of savings of working population.

It is not necessary to compute the total amount of savings. It is enough if changes within the plan period are estimated because that would give an idea as to what amount of additional income will be saved. The underlying theory is that if more money is saved, less will be available for purchasing goods.

24. Commodity expenses can be obtained by deducting non-commodity expenses and increase in savings from total income. For instance, if total cash receipts are equal to 100 milliard roubles, non-commodity expenses 25 milliard roubles and increase in savings in the year is 3 milliard roubles, then total commodity expenses are equal to 72 milliard roubles. It is this amount which is likely to press on the supply of goods. This no doubt gives the over-all picture but then it is necessary also to know the distribution of this as between different classes of the population *e.g.*, between workers of factories and those of the collective farms. For instance, to the extent that the workers of factories make purchases at the collective farm markets, there is a transfer of income from the industrial workers to the collective farm workers. Since the consumption pattern of the latter is different from the consumption pattern of the former, it is important to know the extent of this redistribution of income for the purpose

of planning trade. It is also necessary to have some idea as to how the total of commodity expenses is broadly distributed amongst different commodities and for this purpose special studies and surveys have to be undertaken.

25. After the necessary data about commodity circulation have been obtained, the planning authorities have to determine how best to correlate with it the various articles on which this amount is likely to be spent. For this purpose a special index number is prepared.

Index of Commodity circulation.

In preparing this index number care is taken that the volume of planned stocks of goods earmarked for commodity circulation should always exceed the receipts for commodity circulation by a small amount. Thus if commodity circulation is equal to 1,000 million roubles, stocks of goods should be 1,030 or 1,035 million roubles. The margin varies in different cases and in different periods and depends on—.

(a) scale of reduction of prices determined by the State for the plan period. This means that the physical amount of goods sold must be gradually increased following a certain plan so that the total volume of money receipts being the same if the supply of goods increases, it may be possible to bring about a progressive reduction of prices. These reductions are systematically carried out. For instance, in 1954 as a result of reduction of prices the people gained as much as 20,000 million roubles.

(b) norms of commodity stocks established by the State. The usual norm is that the trade network should always have stocks of goods sufficient for 60 days on the average. For different kinds of goods, however, and for different trade organisations the actual figure varies. For instance, the figure is higher for trade organisations which are situated at a long distance from manufacturing organisations. Moreover as the volume of commodity circulation varies, these norms have also to be varied from time to time. For the purpose of determining the volume of goods which should be released to the trade network against the volume of commodity expenses calculated as explained above, the method of balances is used. This is based on a list of commodities which is revised from time to time following the chain method. With the help of this list the plan of balances as prepared by the Gosplan and approved by the Government is given effect to. This plan determines in considerable detail what volume of different goods should be made available to the public.

Marke Fund. 26. It is the determination of the amount to be sold to the people or the market fund, as the Russians call it, which requires special care. In the Soviet Union about 60 per cent. of all market funds is distributed by the Union Government itself. The remaining 40 per cent. is distributed by agencies of the Republic Governments and by co-operative industrial enterprises. The list of commodities for popular consumption contains about 40 to 45 important items *e.g.*, flour, flour products, meat products, fish products, fats, sugar, textiles, footwear, knit-wear, furniture, soap, etc., which are distributed by the various Ministries of the Central Government either through their own agencies or the agencies of the Republic Governments. Commodities like watches, radios, sewing machines, etc., are distributed by the Ministry of Trade. Those commodities, production of which is of the nature of local enterprises *e.g.*, the production of pencils, etc., are distributed in the same locality. Formerly there was greater centralisation in the matter of distribution; recently there has been considerable relaxation, the present emphasis being to give the maximum possible initiative to local trade organisations. At present 60 per cent. of the retail commodity circulation handled by the Ministry of Trade is carried out by the local trade organisations of the Ministry. The Central Directorates of the Ministry of Trade handle only about 40 per cent. of the total volume of transactions.

Study of demand. 27. The Ministry of Trade and the Central Co-operative Union carry out special studies of the demand situation and of the consumption pattern. For this purpose the Ministry of Trade has set up a Central Institute of Trade which concentrates on studying problems like methods of planning of retail trade, reduction of costs of circulation, relationship between trade and industries producing for popular consumption, determining internal resources and trade, etc.

28. There are a number of practical problems in regard to the estimation of demand and consumption pattern which have not yet been quite solved. An attempt is being made to solve these problems by setting up a number of control shops where these problems are being analysed in detail. Simultaneously special conference of buyers and consumers are being held to find out their preferences. The Directors of the various Department Stores hold periodical conferences of consumers with this object in view. In estimating the distribution of the total volume of commodity circulation, plans are made not only on the basis of the volume to be handled by the various organisations *e.g.*, the Ministry of Trade, the Central Co-operative Union, etc., but also on a territorial basis. The Council of Ministers of the Union Government determines the distribution as between the various trade agencies of the Union Government and those of the Union

Republics. The Council of Ministers for the Union Republic in their turn determine the territorial distribution as between various regions, districts, cities, etc. As has been mentioned earlier the plan for commodity circulation also includes plan for reduction of cost of circulation. Principal items included in the cost of circulation are:—

(i) Wages of workers and employees (40 per cent. of total costs),

(ii) Maintenance of shops and general house-keeping (7 per cent.),

(iii) Transport (23 to 25 per cent.).

(iv) The interest on credit granted by the State (3 per cent.),

(v) Losses, and

(vi) Advertisement.

In U.S.S.R. the margin allowed for cost of circulation between wholesale and retail prices included in turnover tax is 7 to 8 per cent. for industrial goods and somewhat lower for foodstuffs. Out of this, profit comes to about 2 to 2½ per cent. and the balance represents transport and storage expenses and distribution costs.

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CHAPTER VII

ROLE OF FINANCE IN SOVIET ECONOMY

Physical Planning & Financial Planning. It will appear from what has been said in the previous chapters that economic planning in U.S.S.R. is carried out primarily in physical terms. This is facilitated by the fact that U.S.S.R. possesses a very elaborate system of statistics and also detailed information about various technical co-efficients derived from the "norms" which have to be fixed as a matter of routine by various enterprises under the Soviet system of factory and farm management. The necessary correlations are worked out by the method of balances.

2. But planning in U.S.S.R. is also done in financial terms and financial controls play quite an important role in the Soviet economy. The usual procedure is to carry out preliminary planning in physical terms as far as practicable and then to translate it into financial terms and make an estimate as to how much of the financial requirements of the Plan should be met from the resources of State enterprises, collective farms and co-operatives and how much general public funds, *i.e.*, the State budget. It is, however, the latter which really plays the major role in the total financing of the national economy as will be seen from the following table:

In milliard rouble

	From State Budget	From resources of enterprises & farm organisations	Total
Total Financing of National economy.	216·4	110·3	326·7
(i) Heavy industry. . .	79·7	53·5	133·2
(ii) Furtherance of production of consumer goods, improving their quality and enlarging the established trade organisations . . .	14·2	22·4	36.6
(iii) Development of agriculture and animal husbandry .	62·5	11·9	74·4
(iv) Development of Transport etc.	21·5	17·3	38·8

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Resources of State enterprises.

3. Although the State owns and controls all State enterprises, each State enterprise is treated as a separate entity with its own separate account of expenditure, income, profit and loss and programme for current operations and investment. Necessary provision is made in the financial plan of each enterprise not only for current requirements but also for such expansion and development as may be necessary. Each enterprise is required to provide a certain percentage of its income for its own development. But the State provides the basic funds which the enterprise requires initially and also lends for specified periods such additional working funds as it may need from time to time. The financial return allowed to the enterprise is linked in such a manner to the degree of fulfilment of the tasks allotted in the plan (*inter alia* through a system of incentive bonuses for performances of individuals, shops, plants, etc.) that the management and workers of the enterprise become materially interested not only in the fulfilment and even over-fulfilment of the plan but also in the most economic utilisation of the resources placed at its disposal. The State exercises its economic control over these enterprises to a considerable extent in financial terms. The main objectives of these controls are (i) reduction of cost of production, (ii) timely repayment of loans given by the State to the enterprise, (iii) more effective utilization of the basic funds, (iv) fulfilment of the plans of capital accumulation, (v) accomplishment of the planned tasks of the enterprise in conformity with the prescribed quality as well as output and (vi) maximisation of the production of the enterprise along the lines indicated in the Plan.

Resources of collective farms and co-operative enterprises.

4. Unlike State enterprises which as a whole constitute the common socialistic property, the resources of enterprises in the collective farm co-operative sector constitute the collective property of the respective organisations. Each co-operative enterprise has ordinarily to find the capital required for increasing its output as prescribed in the plan out of its own resources. It can, however, get part of its working capital as loan from the State Banks. The transfer of resources from one co-operative enterprise to another or from a co-operative enterprise to a State enterprise is deemed to represent the fulfilment of trade relations. The degree of development of these trade relations determines the relative importance of money in the economic activities of co-operative enterprises and also the degree of development of their financial resources.

General Public Funds.

5. General Public funds which are represented by the State budget are utilised for satisfying the general needs of the Society *e.g.*, general administration, defence, education, health, scientific research, insurance, provision of capital for expanding productive resources, etc. The chief source of revenue for the State budget is the profit and accumulations of the State enterprises. This takes the

form of taxes on turnover, deductions from profits, deductions for the fund of State social insurance, return of loans given by banks and payment of interest on these loans. The second important source is the obligatory payments by the collective farms and co-operatives partly for privileges enjoyed and partly for services rendered by M.T.S.'s, Electric Stations, etc. A third source is tax on personal incomes, payment of insurance premia and loans from private individuals. Receipts from taxes and other levies on collective farms, co-operatives, and individuals constitute, however, only 8 per cent. and State loans only 2·8 per cent. of the U.S.S.R. Budget in 1954. Bulk of the receipts come from the first item mentioned above.

High turnover Tax and Low Income Tax.

6. One of the main characteristics of the Soviet fiscal system is the very high rate of turnover tax which is sometimes as much as 500 or 600 per cent. and low rate of income tax which varies between 2 per cent. and 13 per cent. This is against the canons of progressive taxation with which we are familiar in this country. But the economists in U.S.S.R. are of the view that the canons of taxation which prescribe a low rate of sales tax and highly progressive rate of income tax in capitalistic societies where there is no direct State control over personal income are not applicable to a socialistic society where levels of personal income are directly controlled by the State. In such a society income tax need not be a tool for reducing social inequality but represents only the contribution which the individual should pay towards the cost of administration of the country. The turnover tax, on the other hand, is considered to be very important for such a society in as much as it serves as a tool of economic control especially for maintaining a balance between supply and demand of various commodities.

7. Soviet authorities make quite an extensive use of financial measures as an instrument for controlling production and distribution and utilise what they call "credit-banking" as well as "finance-budget" methods for this purpose.

Role of State Banks in Financial Control (Credit-Banking Method).

8. The banks which are all owned by the State serve both as the treasury and as the accounting centre for all enterprises in the country. They also provide short-term credit. Every State and co-operative organisation must keep its funds in the State Banks. By keeping accounts of individual enterprises, organisations and institutions, supervising their monetary transactions and making payments according to the provisions of the State budget, the banks are enabled to control the whole of the circulating funds in the economy. The fundamental tasks of this control are:—

(i) to supervise and to assist the execution of financial operations as provided in the plan;

(ii) to stimulate better utilization of resources by factories, firms and other enterprises and to show the possibility of more effective utilization of basic funds, quick repayment of loans, reduction of costs of production and distribution, stimulation of savings, etc.;

(iii) to audit the accounts of all State enterprises and prevent misuse of State funds; and

(iv) to strengthen financial (budgetary, credit and accounting) discipline in general.

Role of the State Budget (Budget—Finance method).

9. It is, however, the State budget which is the basic financial plan of the State that consolidates finance relating to all branches of national economy, industry, crop production, administration, defence, etc. This basic financial plan is based on the various indices of the national economic plan *e.g.*, volume of capital investment, quantity, quality and cost of different products, volume of turnover and stocks of goods, volume of education, health, etc. The fundamental tasks of financial planning are held to be:

(i) estimation of the resources of national economy, their allocation for the satisfaction of the various urgent needs of the society according to prescribed priorities and the full mobilisation of all these resources;

(ii) stimulation of the effective utilisation of all materials, labour and monetary resources and ensuring the maximum possible economy;

(iii) guaranteeing the planned proportions in the national economy, maintenance of the conformity between distribution of incomes and the distribution of the goods produced according to the national economic plan.

Role of Soviet Ministry of Finance vis-a-vis Administrative Departments

10. While it is the Planning Commission which formulates the national economic plan, it is the Ministry of Finance which prepares the State budget in the light of the approved plan and takes the responsibility for the proper implementation of the financial part of the national plan. In this context it may not be out of place to describe the role which the Soviet Ministry of Finance plays *vis-a-vis* the administrative Ministries. Once the annual operational plan which is formulated largely in physical terms is finally decided, each administrative Ministry proposes the budget provision in financial terms according to that plan and this is scrutinised by the Ministry of Finance. After the budget has been approved by the Government, the administrative Ministries are free to spend the amounts as laid down in the plan. There is no question of further expenditure sanction as is the practice in this country. Each officer in charge of a certain budget head is free to spend the allotted amount without any further reference

to the Finance Ministry. This is considered important because it is the officer in charge who is held responsible for the expenditure of the sum provided and carrying out the project concerned. If the officer fails to carry out the project and if the sum provided remains unspent he becomes liable to disciplinary action. On the other hand if the Finance Ministry's concurrence was necessary before any expenditure could be undertaken then the officer concerned could not be made entirely responsible for non-fulfilment of his part of the plan. Hence, once the budget is passed, the Finance Ministry holds only a watching brief and has no power to interfere on its own account with the working of any administrative Ministry. From each spending Department it gets a short report regarding expenditure every month and detailed report every three months. It scrutinises these reports and if it is dis-satisfied with any action taken or if it feels that the situation has changed so much since the budget was provided that certain expenditure which has been sanctioned in the project should not be made under the new circumstances it first draws the attention of the officer concerned and has a discussion with him. If there is no agreement and if the Finance Ministry feels that the subject is important enough the Finance Minister contacts the Minister in charge of the Department under question and discusses the matter with him. If there is no agreement and the Finance Minister feels that the matter is important enough to be taken to the Cabinet, he sends a note to the Cabinet, which then examines the question in the light of the explanations given by the Minister in charge of the Department concerned and it is only the Cabinet which has the power to give a directive to the Department not to proceed with the expenditure in question. Until this directive is given by the Cabinet, the Department concerned is free to go on with the expenditure as was originally planned. We were told that this procedure has the advantage that it places the responsibility for action squarely on the Department concerned and at the same time it enables the Finance Ministry to keep under review the different items of the expenditure. And since it is only the Cabinet which can take a decision that certain expenditure should not be incurred the Officer in charge cannot plead that they could not take any action because of interference from somebody else. If the Cabinet asks him not to spend the money and not to go on with the project, then naturally he has no further responsibility.

11. Considerable importance is given in U.S.S.R. to keeping a continuous watch over the progress of the plan, taking effective and prompt measures to remove any bottlenecks or other obstacles which may crop up from time to time and adjusting the plan suitably to meet changing circumstances as and when necessary. For this purpose a number of indices are prepared designed to

bring out the three main balances of the economy *viz.* (i) material balances relating to correlation between production and consumption of different products in kind, production, depreciation and distribution of capital goods, utilisation of raw materials, accumulation of consumer goods, exports, imports, etc. (ii) labour balances relating to availability, distribution and utilisation of different types of unskilled and skilled labour, technicians, specialists etc. and (iii) financial balances relating to distribution of national income as between accumulation and different types of consumption, allocation of capital investments as between productive enterprises and social and economic overheads, volume and distribution of wage funds and market funds, volume of commodity circulation, volume and distribution of the cash plan of the State Bank, etc. It is the duty of the Planning Commission and the various Ministries to keep a constant watch over these indices and take such action as would ensure a balanced development of the national economy. Any default on the part of an officer in charge of a department or enterprise is very severely dealt with. "Norms" of performance are fixed in each case and full powers given at each level commensurate with the responsibility prescribed. While overfulfilment of the "norm" brings handsome rewards, under-fulfilment means automatic reduction of remuneration in ordinary cases and removal from office or even more severe punishment in cases of serious default except where there are satisfactory extenuating circumstances.

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CHAPTER VIII

SOCIALIST SYSTEM OF AGRICULTURE IN U.S.S.R.

The main characteristic of Russian agriculture is that it is almost entirely socialised. It has as its basis two forms of property—

(i) State property,
(ii) Collective farm property,

and includes 3 major organisations *e.g.,* (i) Collective farms. (ii) Machine Tractor Stations and (iii) State farms.

Co-ordinated development of Agriculture and Industry.

2. In U.S.S.R. considerable emphasis is put on a coordinated development of industry and agriculture, because industry gets its raw materials and food from agriculture while agriculture gets machines and equipment and various industrial products from industry. The Russians in all their economic literature try to emphasise this interrelationship. Agriculture cannot be developed without the development of industry. For, any highly developed agriculture depends very much on industry which supplies tractors, fuel, insecticides, fertilizers, etc. Similarly development of industry cannot be accomplished without development of agriculture because the working class cannot live without cereals, milk, meat, etc. Raw materials like cotton, wool, flax, sugar-beet, etc., are also essential for industry.

Progress claimed since the revolution.

3. Russian authorities claim that substantial progress has been made by their agriculture since the Revolution. Productivity of labour in agriculture is now claimed to be three times the productivity of labour before the Revolution. The marketed surplus of various agricultural products has, it is said, increased as follows between 1926-27 and 1952-53:—

(In million tons)

	1926-27	1952-53
Cereals	10·3	40·4
Potatoes	3·0	12·9
Meat (live weight) ..	2·4	5·0
Milk	4·3	13·2

Equally good results are also claimed in regard to cotton, sugar-beet and some other industrial crops. But it is admitted that still the achieved level of agricultural production in U.S.S.R. falls far short of the urgent needs of the population. It is also admitted that the present level of production is much lower than the potentiality for agricultural development which modern science and technology have opened up. As an explanation of the relatively lower emphasis on agriculture in Soviet Russia until recently, it is said that the Communist party in the Soviet State had to give first priority to the development of heavy industries as a necessary condition for the development of all the branches of general economy. And for this purpose all the resources and best personnel were concentrated on the development of heavy industries. It was very difficult at that period to develop simultaneously both industry and agriculture. The result was that agriculture lagged behind. Now that the development of heavy industry has progressed satisfactorily, it is possible to take measures for the rapid development of the various branches of agriculture, and the Party as well as the State have been concentrating their full-time attention on this since 1953-54. In fact it was found that the development of industry was suffering as a result of the inadequate development of agriculture and inadequate supply of consumer goods. One object of the new drive for developing agriculture is to supply more consumer goods to the working population so as to provide sufficient incentive to them.

Grains.

4. One of the most important branches of Russian agriculture is the production of grains. In fact it is considered to be the basis of all agricultural production. For instance, in order to solve the problem of animal husbandry it is necessary to supply the cattle with adequate grain fodder *e.g.*, maize, barley, oats, etc. Grain has also to be supplied to workers in other fields, industrial as well as agricultural.

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Animal Husbandry

5. The other important task is to develop animal husbandry to supply the necessary meat, milk and other animal husbandry products. The development of animal husbandry in its turn requires a very good fodder base. very good barns, mechanisation of processes of animal husbandry, selection of breeds, rearing of new breeds, etc. Besides, it is also important to develop the production of supplementary and protective foods *e.g.*, potatotes, vegetables, grapes and other fruits.

Land utilization.

6. One of the primary concern of the Russian authorities is to make proper use of all available agricultural land. The collective farms and State farms in U.S.S.R. do not have to buy land. They are given land free of charge by the State. The collective farms are virtually proprietors of land, the only thing they cannot do is to sell or let out land that is given to them by the State. At present the collective farms have 397 million hectares of arable land and 181 million hectares of forests and virgin lands *i.e.*, a total of 578 million hectares of all types of land. The State farms have 70 million hectares of all

types of land. The farms belonging to various industries and other enterprises have altogether 19 million hectares of land. The collective farms and State farms have considerable amount of virgin and waste lands and recently large scale efforts are being made to reclaim these lands. Present plans are to reclaim 28 to 30 million hectares in eastern areas by 1956. The target for 1954 itself is 15 million hectares. Besides reclaiming new lands, attempts are also being made to increase the size of the average collective farm by combining a number of smaller collective farms. Formerly there were over 200 thousand collective farms in U.S.S.R. Now many of these have been combined and the total number has now been brought down to a little over 94,000. The theory is that the larger the area, the easier it is to use large scale machineries, tractors, etc.

7. The main emphasis in U.S.S.R. is on extensive cultivation. But recently considerable attention is being also paid to intensive cultivation *i.e.*, to better methods of agronomy, use of larger quantities of chemical and organic fertilizers, breeding of cattle of high quality, etc.

Mixed Farming.

8. In U.S.S.R. a great emphasis is being put on mixed farming. It is felt that mixed farming enables the best possible use of the resources and involves the minimum waste inasmuch as it enables a full utilization of all the by-products. Considerable emphasis is being also put on regional specialisation of crops. We were told that specialisation makes possible the full use of the concrete conditions in a district for the planning not only of a particular crop but also of all the primary and secondary branches of agriculture.

9. It appears that in recent years considerable damage was done to the agriculture in U.S.S.R. because the planning authorities often prescribed methods without proper testing and the chairmen of collective farms tended to adopt rather blindly these half-baked ideas which were passed on to them. Recently the Government has severely condemned all officers and collective farm workers who were responsible for this state of affairs.

10. In Russsian agriculture, the Machine Tractor Station has the most important role to play inasmuch as it provides the industrial basis for the collective farms. All the collective farms are serviced by the Machine Tractor Stations maintained by the State. All the major agricultural machines are the property of the State. The State ownership of machines is said to provide conditions under which a constant improvement of the agricultural technique becomes feasible. The cost of developing and also producing a big machine is high and it would normally take up a number of years before the collective farms get adequate returns from these machines. In fact

it may be beyond the capacity for most collective farms to pay for the machines. The State ownership of machines removes this difficulty and enables the collective farms to use these costly machines.

11. Huge amounts are being spent in U.S.S.R. for the development of agriculture. In 1953 the budget for the development of agriculture amounted to as much as 52 milliard roubles while in 1954 it was as much as 74·4 milliard roubles. The amount provided in the Budget for further strengthening of Machine Tractor Stations is 30·8 milliard roubles.

Link between Farm and Factory.

12. As has been mentioned earlier Machine Tractor Stations provide the industrial basis for collective farm production and form the link between workers of industries and workers of farms. Not only do they provide machines to the collective farms but all types of technical services are also channelised by the State through the Machine Tractor Stations. In fact the Machine Tractor Station is an important tool in the hands of the Soviet State for controlling Russian agriculture. In 1953 the Machine Tractor Stations possessed 80 per cent. of the total horse power of all mechanical and electrical motors used in collective farms and Machine Tractor Stations in U.S.S.R. Ploughing was completely mechanised and of the various technical processes in Kolkhozes about 80 per cent. were mechanised by Machine Tractor Stations. It is estimated that in 1953 Machine Tractor Stations saved 21·9 million labour years which would have otherwise been required before collectivisation.

13. In the beginning Machine Tractor Stations were primarily used on grain farms. Now they are being increasingly used in other branches of agriculture and even in animal husbandry. In U.S.S.R. the greatest emphasis is being put on the mechanisation of various agricultural processes. Mechanisation is valued not only because it increases production or reduces the irksomeness of labour but also because it economises human labour. It appears that in spite of her large population U.S.S.R. today has a genuine shortage of labour. The demands on man-power from the various development projects as also the Defence Services have necessitated that machine should increasingly take the place of man both on the farm and the factory. That is why bigger and bigger machines are being introduced to reduce the proportion of labour used on the farm and in order to make the use of bigger machines economical, the size of the collective farm is also being extended.

14. Machine Tractor Stations are used in U.S.S.R. as an agency for extension work. Machine Tractor Stations are utilised for the planning of economies, personnel

management and organisation of labour, introduction of improved cultural practices in the collective farms, etc.

15. There has been recently considerable re-organisation of the structure of the Machine Tractor Stations. Prior to 1953, all the workers in Machine Tractor Stations were seasonal workers. As a result they did not identify themselves sufficiently with the work of the Machine Tractor Stations nor did they have that sense of responsibility which was expected of them. Since 1954 all of them have been made permanent employees of the Machine Tractor Stations. There are altogether 9,000 Machine Tractor Stations in U.S.S.R. employing altogether 12,50,000 permanent workers including 8,70,000 tractor drivers, 1,87,000 Chiefs and Assistant Chiefs of Brigades, and 24,000 trained mechanics. A net-work of technical schools was started in 1953 to train this large army of workers. In 1953 as many as 100,000 agronomists and animal husbandry experts were sent to Machine Tractor Stations for servicing the various collective farms.

16. Machine Tractor Stations usually enter into a contract with the collective farms which they serve. According to this contract the collective farms pay to the Machine Tractor Stations both in money and in kind. The volume of work done by the Machine Tractor Stations for the collective farms is judged on the basis of the income in kind as well as in cash per hundred hectares of land. What proportion of the payment to the Machine Tractor Stations should be in kind is determined by the Government according to the economic and agricultural conditions in different regions. This payment in kind is the main source of procurement of various agricultural products for the Government. The money which the State gets by selling the agricultural products received by the Machine Tractor Stations in payment for services rendered is spent on reimbursing the cost of machines and the salary of the staff. The State also makes a profit which goes for further construction and strengthening of Machine Tractor Stations.

Payment of wages in M. T. S.

17. Both the permanent and seasonal workers of a Machine Tractor Station get their wages according to piece rate. They are paid according to the system of labour day unit. But the State assures them a certain guaranteed minimum wage in cash and in kind. The quantum of this minimum depends on whether the Machine Tractor Station is able to carry out that plan or not. This minimum is fixed for the Machine Tractor Station as a whole. So far as the individual workers are concerned, they get their wages according to labour day units performed by them and they also get share of collective farm products along with the collective farm

workers. Machine Tractor Station workers who do not work in the fields but in shops are usually paid only in cash according to piece rate. Besides tractor drivers, there are officers like agronomists and animal husbandry experts in Machine Tractor Stations who get regular salary in cash from the State. But when the crop of the collective farms under them exceeds the norm they get a premium of 10 or 20 per cent. of all the labour day units which are credited to the Chairmen of the collective farms during the year under consideration. Chief officers of Machine Tractor Stations also get bonuses besides salary for good work. This system of payment according to piece rate plus premia and bonuses makes Machine Tractor Station workers more interested in increase of productivity. Since the collective farms do not have to buy land or machines, they are in a position to invest more money in improving their lands than they would otherwise be.

Collective Farms.

18. While the machines provided by the Machine Tractor Stations are the property of the State, the common land of the collective farms and other means of production on the collective farms as well as the products of the collective farms are the property of the farms. The means of production owned by the collective farms are the collective farm cattle, simple machines and implements, farm buildings, seeds etc. All these means of production together with the tools of work, the worker himself, cattle, buildings, transport, some auxiliary enterprises, plants and trees, irrigation, constructions, some materials and money for further development of the common land, collective farm clubs, libraries, nurseries, kindergartens, etc., are part of what is called the undivided fund of the collective farm. Great emphasis is being paid in U.S.S.R. to the steady growth of the undivided fund of the collective farm as a necessary condition for developing the common land of the collective farm. This fund is spent on construction of the following:—

cattle farms, irrigation canals, drainage works, tanks, electric stations **etc.**

During the period 1946—50 collective farms in U.S.S.R. spent as much as 40 milliard roubles for the development of the common land and during 1951—53 they spent as much as 36 milliard roubles. Besides this, they spent 11 milliard roubles during 1946—50 and 5 milliard roubles during 1951—53 for the development of poultry and cattle. While the collective farms have to develop within the general frame-work of State planning, the plans of the collective farms themselves have to take account of the local conditions. As has been mentioned earlier there is considerable emphasis in U.S.S.R. on mixed farming. Mixed farming, it is claimed, helps the optimum

mum use of resources and gets the maximum yield from the farm. Mixed farming also ensures continuous employment of the workers throughout the year.

Brigades.

19. In a collective farm the main unit of organization of labour is the brigade. There are several types of brigades—plant growing brigades, animal husbandry brigades, fodder brigades, vegetable brigades, orchard brigades and construction brigades. For instance, a plant growing brigade has an allotment of land fixed by the administration of collective farm. It is given a fixed number of tractors, combines, etc., as well as special types of cattle commensurate with the job that it is required to do. A brigade is divided into a number of sections, especially where lot of manual labour is to be used. Similarly animal husbandry brigades have fixed number of animals, etc., for which each of them is supposed to be responsible. Care is taken to settle the relation between the Machine Tractor Station Brigade and the Collective Farm Brigade in such a way that the two work together continuously for a number of years. This ensures a better understanding between the two and facilitates harmonious working.

Payment of wages in Kolkhozes.

20. In collective farms as in all other enterprises in U.S.S.R. wages are paid according to the piece rate. Although the ultimate aim of Communism is to have equality of wages, we were told that U.S.S.R. is still in the stage of Socialism where the rule is not payment according to needs but payment according to ability. The more one works the more he would get. The basis of payment is the "labour day unit". The labour day unit is not quite the same thing as working day. It is more or less a norm which is fixed after careful time and motion study and takes into consideration the qualification of an average worker, the nature of the work, its importance, complexity, severity, etc. A special study is made by experts of each type of work in a collective farm, who estimate how much an average worker can be expected to perform in course of an eight hour working day. The amount of work that can be thus done by an average worker is then fixed as the norm for a labour day unit and a certain rate of wage fixed for it. If a worker produces less than the norm fixed for the labour day unit he gets proportionately lower wages. As soon as, however, he fulfils the norm he not only gets the full wage fixed for the labour day unit but also gets a bonus. For any additional production he gets a premium. For instance, 8 hour work in the field when work is not very hard will constitute a labour day unit. Other types of work will be higher or lower than this. All work in collective farms is divided into nine broad groups. The first group is the simplest form of unskilled work. If a worker of the first

group fulfils his norm he gets 0·5 labour day unit. The worker who belongs to the 9th group is highly skilled and on fulfilling his norm he gets 2·5 labour day units. All norms are recommended by the State in a general way but each collective farm has to fix its own norms in the light of the general directions given by the State and the special circumstances obtaining in its area. Generally the administration of the collective farm fixes this norm, but it has to be approved by a general meeting of all the collective farmers. The norms are periodically revised in the light of the volume and quality of work done by the best collective farm workers. The norm for a labour day unit takes into account both quality and quantity of work. Highly skilled and intensive labour is given a higher credit compared to unskilled work.

21. All products of the collective farm are the property of the collective farm. But in this production the Machine Tractor Station has also taken a part. That is why the collective farms are required to pay to Machine Tractor Stations in kind which in its turn goes to the State as has been explained above. This means that the collective farms pay for those means of production which they get from the State. Out of the total product of collective farms, whatever is left after payments to the State and the Machine Tractor Stations have been completed is distributed to the workers of the collective farm according to the labour day unit system. The wages which the workers of the collective farms thus receive are their personal property. Besides this the collective farmers also get 'personal income' from their individual allotments. A portion of the income of the collective farm goes to the undivided fund which is common property of the collective farmers and is utilised for developing the collective farm further. A part of the undivided fund may also go to the State for such materials as may be obtained from the State for the development of the collective farm. In practice all collective farm incomes are divided into two kinds—cash and kind. Collective farms get income mostly in kind *e.g.*, grains, vegetables, fruits, meat, etc. Besides this they also get seed, fodder, etc. The collective farms sometimes sell a part of their product either to the State or to other enterprises at fixed prices or to citizens at free prices in the collective farm markets.

22. In order to make the collective farmers take more interest in their work the Soviet authorities recently felt it necessary to fix the norms and premia on an equitable basis. It has, therefore, been now prescribed that all collective farms should make their payments to the State not on the basis of output but on the basis of the area of. land under cultivation. Before 1953 there was a system by which the better collective farmers had to pay more to the State and the

worse collective farmers had to pay less in proportion to their income. This acted as a disincentive to better farmers. Hence the rules have been changed and now everyone has the same norm which makes people more interested in their work. Frequent revision of the norms is also now being discouraged as this tends to affect adversely the farmers' incentives. The State fixes according to the over-all plan the prices of all agricultural products. The level at which the various prices are fixed depends on the relative importance of the product. In fixing the prices care is also taken that the State can make certain amount of profit which can be utilised for the satisfaction of the social requirements *i.e.*, for services for the development of industry, education, health, etc. Sometimes prices are fixed in such a way as to encourage the production of certain commodities. For instance, in the case of industrial crops like cotton, flax, etc., the norms are fixed at a relatively low level and the income allowed to the collective farmer is relatively high because the State is very anxious to increase their production. The State buys the products of the collective farms at fixed prices and sells the products of industry to the collective farms also at fixed prices. But as has been explained earlier, part of the products of the collective farms is sold by the farmers themselves in the collective farm market. In these markets prices are determined by forces of demand and supply.

Fixation of prices of collective Farm Products.

23. Until 1953 the position was rather unsatisfactory. Prices fixed were too low and the collective farms did not have any incentive for increase of production. The Soviet authorities felt that there was an urgent need for allowing some profit or what they called "more material interestedness" for the farmer and hence in September, 1953 the norms of compulsory delivery of collective farms to the State were lowered and the prices were also raised. As a result the additional income in money terms of all collective farms went up by as much as 13 milliard roubles in 1953 and 24 milliard roubles in 1954. Since the norms for compulsory delivery were also reduced the collective farms were now in a position to sell larger amounts of grain to the State at much higher prices. Apart from this relaxation of rules which enabled the collective farmers to make more profit, other steps were also taken *e.g.*, greater degree of mechanisation, better organisation of labour, greater emphasis on socialist competition for increasing the productivity of the collective farms.

24. The relatively low price fixed for the compulsory delivery of grains by collective farms is considered necessary to allow for differential rent. Lands of collective farms differ from each other very much, some are rich or are near markets while others are not. As the

availability of best lands is limited, it is necessary to cultivate inferior lands. The result is that the collective farm workers working under better natural conditions get higher incomes while those working under worse natural conditions get lower incomes. Products of different collective farms are, however, sold at one price in a particular zone. The result is that collective farms which work under more advantageous natural conditions get an additional income on account of this factor alone. And this is what gives rise to differential rent. In other words differential rent is additional income in kind and in money which is obtained by a collective farm with better lands, etc. The Soviet economists claim that this rent is different from rent under capitalism inasmuch as it is not the result of exploitation but is the general reflection of the differential conditions of lands of different farms. They say that under socialism this rent goes not to the individual but to the whole society. This differential rent, the Soviet economists recognise, can arise both from intensive cultivation as well as extensive cultivation. A part of differential rent is left to the collective farm and is utilised for the development of the material and cultural levels of life of the workers. The other part goes to the State. The State absorbs this differential rent in three ways:—

(a) through fixed low prices for compulsory delivery,

(b) through payments in kind through Machine Tractor Stations,

(c) through taxes.

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25. In U.S.S.R. the labour of the collective farmers is considered as the undivided fund. The resources like seed, fodder, etc., are considered as the common fund and there are also a number of special funds.

26. The Russian authorities gave us some figures to demonstrate the great progress made by the collective farms system since its inception. According to these figures it appears that the money income of collective farms increased from 5·7 milliard roubles in 1930 to 20·7 milliard roubles in 1940 and 49·6 milliard roubles in 1953. Besides these the collective farmers also got some income from their personal allotments. The target of the present Five Year Plan is to increase the income of a collective farmer by a further 50 per cent.

State Farms.

27. Besides the collective farms, there are about 4,700 State farms in Soviet Russia. The State farms were originally started for the management of the very large estates which were confiscated from big landlords during

the Revolution. Later on, the system of State farms was utilised for developing special types of agriculture. Recently State farms are also being established in newly reclaimed areas where collective farms would not be a practical proposition because of the shortage of the labour force and of other resources and also because of the distance from inhabited areas. There is a special Ministry for State Farms both at the centre and in the Republics.

28. We had an opportunity of visiting a number of collective farms, Machine Tractor Stations and State farms in Moscow, Leningrad, Stalingrad and Tashkent areas. In the next three chapters we propose to describe in some detail the working of a few of them.

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CHAPTER IX

TWO TYPICAL COLLECTIVE FARMS IN U.S.S.R.

Of the various collective farms that we visited in U.S.S.R. we may make a special mention of the Lenin Collective Farm near Moscow, which is a mixed farm and the Kalinin Collective Farm in Farghana which specialises in the production of cotton. We propose to give below some detailed description of these two farms by way of illustrating the set up of different types of collective farms.

Lenin Collective Farm.

Process of Consolidation.

2. The Lenin Collective Farm is situated at a distance of about 30 kilometres from Moscow. It is served by a Machine Tractor Station which is situated at a distance of about 5 kilometres. This is a mixed farm with an emphasis on the production of animal husbandry products and vegetables. Generally most of the farms near big cities are of this type because it is more profitable to produce vegetables and animal husbandry products in such farms for catering to the requirements of the population of the neighbouring cities. Before 1950 there were six collective farms in the six villages which now comprise the Lenin Collective Farm. In pursuance of the policy of combining smaller collective farms into bigger ones these six small collective farms were combined in 1950 into a single collective farm—the Lenin Farm. The Russian officers accompanying us as also the Chairman of the Lenin Collective Farm were at special pains to explain to us that this integration of smaller farms into a bigger one was effected entirely on a voluntary basis. It appears that the Central Committee of the Communist Party took a decision that in order to introduce a greater degree of mechanisation it was necessary to increase the size of the average collective farm and hence an attempt should be made to combine smaller collective farms into bigger ones. The Government officers and the members of the Communist Party then went round creating a favourable atmosphere for the implementation of this decision. There were a number of meetings at each collective farm. In the beginning there was some opposition. People were afraid that if they combined they would lose their individuality and there might be also some fall in their efficiency and income. The agricultural experts and the members of the Communist Party explained to them how by combining into a large unit they would not only get more help from the State but also would be able to use bigger machines and thus increase

their efficiency and income. After these preliminary meetings were over, there was a general meeting of all the representatives of the six collective farms where they decided by a large majority of votes to combine into a big farm. Although no Government official was present in these meetings, there were present a few members of the Communist Party. It is, therefore, difficult to say how far it was entirely persuasion and how far there was some pressure of the party and the State behind the decision.

The village Soviet.

3. Formerly each of the six villages had a village Soviet of its own. Now five of these villages have only one Soviet and the sixth village is under another local authority. The five villages which are now under the Lenin Soviet have altogether a population of 1,500 families or 6,000 people of whom about half including 1,200 active workers belong to the Lenin Collective Farm itself. The rest of the population are mostly workers in neighbouring factories and their families. Village Soviet is the lowest administrative unit in the Soviet Union. As has been mentioned earlier, the Soviets in U.S.S.R. are organised in a hierarchical structure, all the village Soviets in a Raion or District being combined into a Raion Soviet, all the Raion Soviets in an Oblast into an Oblast Soviet and all the Oblast Soviets being combined into a Republic Soviet. The Soviet which we visited at the Lenin Collective Farm has a total membership of 67 Deputies elected by all the adults in the area once every two years. The Soviet has an Executive Council of 9 members. The total income of the Soviet is about 2,57,000 roubles a year. It appears that out of the total tax collected in a Soviet, 2 per cent. is paid to the Village Soviet for its administrative expenses. The balance of the tax is shared by the higher authorities *viz.*, District, Oblast, Republic and Union Governments. The collective farm itself pays a tax of 2,50,000 roubles. Besides, each individual member of the collective farm pays a tax for the personal allotments of land which he possesses. For instance, the Chairman of the Soviet, Mr. Gusev, himself pays a tax of 160 roubles per year for the private allotment of ¼ hectare of land which he holds. The village Soviet spends its income for its own administrative purposes as also for the construction and repair of schools and residential quarters for teachers, libraries roads, bridges, fire bridgades, electrical equipment, etc. The office of the Soviet and the office of the Collective Farm were situated in the same premises and there seemed to be very close co-operation between the authorities of the village Soviet and the administration of the collective farm.

Some particulars about the Lenin Farm.

4. The Lenin Collective Farm has at present a total area of 1,967 hectares of land of which about 290 hectares are devoted to vegetables, 90 are under cabbages, 74 under carrots, 69 under cucumbers, 20 under table-beet, 300 under potatoes, 190 under fruits and berries, the balance under hot houses, hot beds, buildings, pastures and meadows. The farm has about 1,000 square metres of hot houses and

500 square metres under hot beds for growing vegetables in winter. It has altogether 60 public buildings in which are included the office of the farm, the House of Culture, the residential quarters of the Agronomists and other employees, animal husbandry sheds, machine sheds, storage godowns, etc. It runs a school and a creche of its own. It owns 9 trucks, 86 ploughs, 56 harrows, 15 cultivators, 2 grass cutting machines, 3 rakes, 18 ridgers and 102 carts. But it possesses no tractors or combines which, as has already been said earlier, are supplied by the Machine Tractor Station. Its livestock wealth consists of 450 cows, 625 pigs, 170 horses and 3,000 poultry. Some idea of the relative importance of different products in the economy of the farm may be obtained from the following figures:—

(In '000 roubles)

	1952	1953	1954
Animal Husbandry .	1352	1613	1774
Cultivation	975	1420	2000
Fruit gardens .	368	545	1000

The administration of the collective farm.

5. The affairs of the collective farm are managed by a Committee of Management which has 11 members. Simultaneously there is another body called a Committee of Control, consisting of five members, which keeps a constant watch upon the activities of the Managing Committee and functions as its critic. Both the Committees have to report to the general meeting of the collective farmers and any major policy decision has also to be referred to the general meeting. The farm has a paid Chairman, an accountant and eleven clerks. Besides this office staff, it has the following technical staff at Headquarters—three Agronomists of whom one is paid by the Local Machine Tractor Station and two are paid by the collective farm, two Zoo-technicians or animal husbandry experts of whom one is paid by the Machine Tractor Station and one is paid by the collective farm, two veterinary doctors, two electricians and two automobile mechanics.

6. As has been mentioned above, altogether about 1,200 persons are working on the farm. Out of them 250 work on animal husbandry, 30 are engaged in different trades *e.g.*, carpentry, blacksmithy, etc., 700 are employed in growing different agricultural crops, 100 are employed in orchards and the balance in miscellaneous work. These workmen are organised in a number of brigades. For instance, the workers engaged on production of agricultural crops are organised in 9 brigades, each brigade varies from 50 to 100 workers depending on the nature of work. Each brigade is again divided into a number of sections of 15 to 30 workers each. Three brigades are engaged on growing vegetables, one brigade on hot houses, three brigades

on field crops, one brigade on fodder crops and one brigade on orchards. The leader of a brigade does not work in the field. He concentrates on supervision but the leader of a section works in the field alongwith the other workers. As has been explained in the previous chapter, the payment of wage is on the basis of number of labour day units performed by each . worker. The more labour day units a worker has to his credit the higher is his earning. The lesser the number of labour day units earned by him, the lower is his income. There is, however, a minimum which everyone must perform. If any worker performs less than 150 labour day units per year, he can be thrown out of the farm unless there is some reasonable explanation like illness.

Fixation of Labour Day Units.

7. The system of fixing these norms of labour day units is very interesting. 8 hours' work by an average person for preparing compost or weeding by horse-drawn rakes is considered as one labour day unit. Other types of work are graded in terms of this standard in the light of their irksomeness or intensity. All the farm work is broadly divided into nine groups. 8 hours' work like ploughing of marshes is valued at 2½ labour day units, reclamation of virgin soil 2¼ labour day units, all other types of ploughing, sowing by machine, etc., are credited at 2 labour day units; pre-sowing cultivation, spreading fertiliser with drill—1¾ labour day units; pre-sowing harrowing, spreading of manure, ridging—1½ labour day units, planting by hand—1¼ labour day units; preparing compost, weeding by horse drawn rakes—1 labour day unit; distribution of panels for keeping away snow, gathering of wheat ears by hand—¾ labour day unit; burning of weeds, gathering of sunflower by hand, protection of crops against frost by smoking—½ labour day unit.

8. The above are only some broad illustrations. Within these 9 groups, each type of operation is fitted in and these norms of labour day units are re-determined separately by each collective farm in the light of the broad indications given by the State and of the advice given by experts of the Machine Tractor Stations. It appears that the procedure is to take each item and determine for different types of land how much work can be done by an average worker during a period of 8 hours. Then these norms fixed by the State by time are re-determined on the basis of area and quality of work so that in the Lenin Farm we found that ploughing by horse ·7 hectare of land to a depth of 20 to 25 cm. was counted as 2 labour day units, harrowing of 2½ hectares of land to a depth of 1 cm. counted as 1½ labour day units, loading of manure on 20 carts counted as 1¼ labour day units. But this is not all. The collective farm also fixes separately norm in terms of labour day units which each farmer, each section and each brigade is expected to fulfil during a year and suitable premia and discounts are allowed

according as the respective norms are over-fulfilled or under-fulfilled. Besides this, certain members of the administrative and technical staff have to be paid either partly or wholly in terms of a prescribed number of labour day units. For instance, in the Lenin Farm where the average farmer earned about 500 labour day units last year, the chairman got a salary of 4,800 roubles per annum in cash plus 1,450 labour day units, the accountant got 2,800 roubles in cash plus 850 labour day units and the clerks and junior technicians got 540 labour day units each. Senior technicians like agronomists, zoo-technicians, etc., were, however, paid entirely in cash and got between 9,000 to 12,000 roubles each per annum. At the end of the year, the total net income of the farm both in cash and kind is divided into 2 parts, one part about 40 per cent. goes to the various funds—common fund, undivided fund, etc. and the balance is divided into total number of labour day units earned by the workers and officers of the collective farm during the year as described above. Thus the value of one labour day unit is determined in kind and in cash and then each individual's share is determined according to the total number of labour day units to his credit. While the final adjustment regarding the payment of wages can be done only at the end of the year when final accounts are settled, workers usually get an advance for meeting their day-to-day expenses. We were told that last year the workers of this farm got 16 kilogrammes of different vegetables and 2 roubles in cash for each labour day unit to their credit.

Payments to the state

9. As has been explained earlier each collective farm has to sell to the State a certain amount of its produce at a fixed price and then it is free to sell the surplus either at a negotiated price to the Government or to the general public at the Kolkhoz market. Last year out of a total production of milk amounting to 7,50,000 litres, the Lenin Collective Farm had to give by way of compulsory delivery to the Government 1,00,000 litres at a price of 1 rouble per litre and voluntary sale to the Government 2,00,000 litres at a price of 1½ roubles a litre. Besides this they sold at the Kolkhoz market about 30,000 litres at prices varying from 4 to 5 roubles a litre. The balance of the production was consumed by the collective farmers themselves. Similarly last year they produced about 2,500 tons of potatoes, out of which they paid to the Machine Tractor Station for its service 250 tons, gave 64 tons to the Government at 10 copecks per kilogramme by way of compulsory delivery, sold 600 tons on a voluntary basis to the Government at a negotiated price of 30 copecks per kilogramme and sold about 150 tons in the Kolkhoz market at a price varying from 80 to 90 copecks per kilogramme. The balance of the produce was consumed by the collective farmers themselves. As has been explained already there is an element of rent in the very low price which is paid for the compulsory delivery of the various products of collective farms to the State. Formerly the proportion of

compulsory delivery for potatoes, milk, vegetables, etc. was much higher and the price much lower. For instance, instead of 64 tons of potatoes which this particular farm delivered to the State in 1953 by way of compulsory delivery, in the previous year it had to deliver as much as 640 tons at a price of only 4 copecks per kilogramme. As a result of relaxation of policy in 1953 the price of compulsory delivery of potatoes was raised from 4 copecks to 10 copecks and volume of compulsory delivery was reduced from 640 tons to 64 tons only. It appears, however, that at the same time the collective farm in question voluntarily agreed to deliver as much as 600 tons of potatoes to the State at a price of 30 copecks while the price at the collective farm market was 80 to 90 copecks. To our question whether there was not an element of compulsion in this because the State had got almost the same amount in this year as in the previous year, the reply was in the negative. It appeared that although there was some element of persuasion by the members of the Communist Party, considerable inducement was also given to the collective farmers for delivering this amount to the State. Firstly the entire transportation cost for the voluntary delivery is borne by the Government; secondly in winter when the collective farm needs credit they get advances free of interest from the Government upto 25 per cent. of the total amount of voluntary sales; thirdly upto the amount due from the Government on account of voluntary sales, they can buy equipment and material from the Government at a specially low price. Besides, they can also get a truck from the Government at a concessional price. These inducements, we were told, were sufficient to persuade the collective farmers that it is to their advantage to sell 600 tons of potatoes to the Government at 30 copecks. Moreover, we were told that while the Government takes unassorted potatoes at 30 copecks, it is only the selected potatoes which are sold in the collective farm market and that explains a part of the higher price received in the collective farm market. It is interesting that although the Government purchases potatoes at 30 copecks from the collective farms and milk at the rate of 1½ roubles per litre they sell from the State shops potatoes at 45 copecks per kilogramme and milk at 2 roubles per litre. We were told that this higher price had been fixed to cover cost of transport and distribution and a small turnover tax.

Standard of living of a Collective Farmer.

10. We visited two houses in the collective farm area, one belonging to the Chairman and the other belonging to an ordinary farmer. The houses were of the European type but definitely inferior to the average farm house which one sees in Western Europe, say, in countries like Germany or Denmark. They were, however, much better than average farm houses in India. The houses appeared to be without paint or repair for a number of years and furnishings inside were of an ordinary kind. In both

the houses we found a large number of Icons. In fact we were surprised that the Chairman of the collective farm who was a very trusted man of the Communist Party should openly display so many Icons. We were told that most of the farmers were deeply religious and the Government did not interfere directly with their religious practices. But there was always a certain pressure of propaganda against the priestly class. The name of the ordinary collective farmer whose house we visited was Turbanov. He seemed to be a typical Russian farmer with a small family comprising of a wife and a child. His house, mainly built of timber, contained a small drawing room, two bed rooms, a radio, a sewing machine and an electric stove. Near the drawing room there was a pigsty with two pigs. Behind the house, there was an allotment of $\frac{1}{4}$ hectare of land which Turbanov used for personal cultivation. On this allotment he grew cherries, cucumber, carrots, cabbages, etc. Last year he sold in the Kolkhoz market 3,000 roubles worth of vegetables grown in his personal allotment. Besides that he had earned about 350 labour day units from his work in the collective farm and his total income from the collective farm amounted to 700 roubles and 5,680 kilogrammes of vegetables for the whole year. Normally he is able to earn about 500 labour day units every year. But because he was ill for over two months last year he could not earn more than 350 labour day units. He told us that during his illness he did not get any financial assistance from either the collective farm or the State. It seemed that for the agricultural population there is no sickness benefit in the Soviet Union and that the collective farms normally do not give any assistance to members of the farm who may be sick. It is only in special cases and on application made by a member that the Executive Committee of the collective farm may agree to give a small assistance to a farmer who may be sick for a long time. But that appears to be more by way of charity than otherwise and members are unwilling to take resort to that normally. Turbanov cultivated his little plot of $\frac{1}{4}$ hectare of land with the help of horses lent by the collective farm and with his own spade and shovel. The general standard of cultivation both in his personal allotment and in the collective farm appeared to be more or less the same and of a lower standard than in Western Europe. The clothes both of Turbanov and his wife were rather poorly. The child, however, looked quite healthy. It did not appear that Turbanov had much education. He looked like an ordinary rugged farmer of any other East European country.

General impression

11. We were told that the Lenin Collective Farm is one of the best mixed farms in the country and that it has been awarded Stalin Prize and has also been given a place of honour at the Agricultural Exhibition. There is no doubt that in certain matters it has reached quite a

high degree of efficiency. The animals were of a good breed and the records of milk and meat yield which were shown to us were quite high. It appeared also that the workers were taking good care of the animals. There was no doubt that almost all the workers were working very hard. This was quite understandable because their wages depended on the amount of work that they put in. But from the point of view of organisation, even this premier collective farm in U.S.S.R. did not provide such a good show as one could have expected. It certainly compared quite unfavourably with the model collective farm exhibited at the Agricultural Exhibition in Moscow. The lay-out, the roads, the buildings, the condition of the machines and implements, the standard of cleanliness were not only substantially below what we expected to see from the standards exhibited in the Exhibition but also below the standard of similar farms in Western Europe. Some of the animals were of course very good and almost reached the standards exhibited in the Exhibition. But here again there were hills and valleys. We saw quite a few animals which were definitely substandard. The standard of living of the collective farm workers was no doubt higher than that of the average peasant in other Asian countries. But it was certainly much lower than the standard of living of the average farmer today in countries like Sweden or Denmark. We felt that with the yield that the Russians claimed it should have been possible to assure a much higher standard of living for the collective farm worker. It is possible that part of the poor standard was only apparent and was due to the traditional way of living in U.S.S.R. but partly it may be also due to the fact that a large part of the income of the collective farm is taken away by the State by way of taxes and by way of relatively lower prices for State purchases.

The Kalinin Collective Farm.

12. The other collective farm which we propose to describe here as representing a very different type of region as well as farming is the Kalinin Collective Farm that we saw at Andhijan in the Farghana District of Uzbekistan. In Chapter II, we have already given an account of our visit to this farm and the interesting discussion that we had with the very capable chairman of this farm. If the Lenin Farm near Moscow is one of the best in European Russia, the Kalinin Farm is undoubtedly one of the best in Asian Russia. It has a total area of 1,700 hectares out of which cotton is sown inasmuch as 850 hectares. The yield of cotton is about 35 centners per hectare. In about 150 hectares they grow various vegetables and they get an yield of about 50 tons per hectare on the average. The rest of the land is used for growing fodder mainly lucerne for cattle. The gross income of the farm last year was 17 million roubles and they are able to pay a wage of 21 roubles and 4 kilogrammes of wheat plus some vegetables for each labour day unit. The number of labour

day units earned by each labourer averaged 400 units in 1953. The average farmer thus got a cash wage of about 8,000 roubles per annum. The Chairman, however, got as much as 25,000 roubles in 1953. The total population living on the farm is 2,225 of whom 1,140 are actual workers. There is a school and nursery and creche on the farm and the farm has its own teachers and doctors. It appears that out of the total gross income of the farm it has to pay 11 per cent. to the Machine Tractor Station in kind for services rendered. The tax paid by the collective farm to the State amounted to 5,00,000 roubles last year. Formerly this tax was on the basis of yield but since 1953 it is on the basis of area. The undivided fund of the farm amounted to 8 million roubles—an increase of as much as 6 million roubles over the previous year. Thanks to a very good yield of cotton and very good price which was paid by the State, it was possible in 1954 to put such a large amount in the undivided fund. Usually 20 per cent. of the total income is put in the undivided fund. This fund is kept in a State Bank and the interest earned varies from 2 per cent. to 6 per cent. depending on the nature of the deposit. The Kalinin Farm did not require any loan from the State last year. Their total capital assets amounted to as much as 37 million roubles.

Mechanisation.

13. The farm is highly mechanised. The processes like ploughing, cultivation, harrowing are 100 per cent. mechanised. Spraying of fertilizers and insecticides is done from air by plane. These planes are taken on hire from the local flying clubs. Although quite a large proportion of cotton picking is still done by hand, we found a large number of big cotton mechanical harvesters in operation. It seems that the Uzbek farmer who was amongst the most technically backward peasants in the world 37 years back has become one of the most mechanically minded today. We were told that the farm was currently giving a trial to electric tractor ploughing. It was very cheap on fuel but was still on an experimental basis. The whole farm is electrified. The cotton produced in the farm is of the variety called Farghana 108. We were told that this cotton was evolved by the cotton breeders and is one of the most popular. Its quality is almost as good as the average Egyptian cotton. It seemed that 37 years back there was very little cotton grown in Uzbekistan, the quality was poor and the yield was low. In fact even in 1929 the Chairman of the farm himself got a yield of only 10 to 12 centners of cotton per hectare while at present he is getting a yield of as high as 30 centners per hectare. Besides, the quality of cotton is also now much better.

Standerd of Living.

14. Some of the collective farmers appeared to be quite prosperous from their looks and from their dress. Many of them had bicycles, some had even motorcycles. But their houses were extremely poor. They were very

different from the houses of the Lenin Farm and were of the Asian type—somewhat like the mud houses surrounded by mud walls which one sees in the villages of Punjab and U.P. The rooms in some houses were, however, decorated with good carpets, etc. But the collective farm buildings were very magnificent. The meeting room and the Opera Hall were very imposing buildings indeed.

15. We noticed a great diversity in the standard of the various farms that we saw and it would not be correct to generalise about the efficiency of agriculture or the standard of living of the collective farmers from the few farms which were shown to us. For every good collective farm, there are 2 or 3 which are bad. For instance there is no comparison between the Kalinin Collective Farm which was shown to us by the authorities and the rather poor collective farm that we saw near our hotel in Tashkent. There is no doubt, however, that the authorities are doing their utmost to improve the level of efficiency of all collective farms. The recent grouping of small farms into larger ones and emphasis on mechanisation are steps in this direction. We wondered, however, whether with an increase in size beyond a certain limit, management did not tend to become less effective and did not more than off-set the so-called economies of large scale production.

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CHAPTER X

MACHINE TRACTOR STATIONS IN U.S.S.R.

A typical Machine Tractor Station.

1. We had also the opportunity of inspecting a number of Machine Tractor Stations which as has been explained in Chapter VIII, are the driving force behind the collective farm system in U.S.S.R. and the channel between the State and the collective farm. We propose to describe here, as an example, one of the Machine Tractor Stations which we saw near Tashkent in Uzbekistan. This Machine Tractor Station was named Second Yangi Yulskaiya (or New Way) Machine Tractor Station of Tashkent. It is situated in quite beautiful surroundings and the Director, Galisintski, who received us, appeared to be a man of considerable ability. This Station is in charge of servicing six Kolkhozes, the major crop of all of which is cotton. The total area under cultivation in all the six collective farms which are served by this Machine Tractor Station is 8,000 hectares, of which about 5,600 hectares of irrigated land is under cotton, about 396 hectares of un-irrigated land is under grain, the balance is under lucerne. The usual rotation in this area is lucerne and cotton. The biggest Kolkhoz has more than 2,000 hectares mostly under cotton and the smallest Kolkhoz has about 1,200 hectares also under cotton. The nearest collective farm is just adjacent to the Machine Tractor Station and the farthest collective farm is about 7 kilometres from the Machine Tractor Station so that the maximum distance which the tractors of the M.T.S. have to travel is 7 kilometres. There are good roads from the M.T.S. to all the Collective Farms.

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History.

2. Mr. Galisintski gave us a brief history of the development of collective farms and M.T.S. in the area. It appears that even in the twenties the area was full of small farms. There were a few big holders who had 200 hectares or more of land each but most of the farmers had only 1 to 2 hectares of land. In 1929 when collective farms were started in this area, 95 per cent. of the farmers joined the collective farms. The land of the big holders was confiscated and most of them migrated either to the towns and took to different trades or joined collective farms in other areas. They were not allowed to join collective farms in the same area where they used to have big holdings previously, lest they acted as subversive elements. About the same time that these collective farms were organised, a Machine Tractor Station—the first Yangi Yulskaiya M.T.S., was also set up to provide the necessary machinery, seeds, fertilizers and technical help

to these collective farms. In course of time there were more collective farms established in the area and the work of the old collective farm also increased and, therefore, a second M.T.S., the Second Yangi Yulskaiya M.T.S. which we visited, was set up in 1946.

Organisation.

3. The organisation of this Machine Tractor Station is as follows:—It has one Director and two Deputy Directors, one of whom is the Chief Engineer and the other is the Chief Agronomist. Besides the above, the Machine Tractor Station has a number of specialists—One Deputy Agronomist, one Planning Agronomist, one Entomologist, one Chief Agronomist at Headquarters and one Agronomist of the M.T.S. located in each collective farm, one Zoo-technician at Headquarters and one Zoo-technician of the M.T.S. located in each collective farm, one cotton mechanic and one electrical mechanic at Headquarters and one local mechanic of the M.T.S. located in each of the six collective farms, one Director of Repair Shop and 44 other workers. Besides this, the M.T.S. has 15 tractor brigades, in each brigade there are 11 tractors serviced by one foreman, one assistant foreman, one accountant and 11 tractor drivers. There is also an Amelioration Division with two tractor brigades, a number of bull-dozers, road building equipment, drainage equipment, etc. This division is in charge of road building reclamation work etc., and it works under a special engineer. There are altogether 300 workers, 200 tractors and 50 combines, bull-dozers and other machines in this M.T.S. Before September, 1953, the tractor drivers of the M.T.S. were members of the collective farms, but since then they are working as permanent employees of the M.T.S. itself. The advantage, we were told, is that they have now more secure employment as they are whole-time employees of the Government and they are also under better discipline. As in the case of collective farm workers the wages of M.T.S. workers are also based on the system of "norms" of labour day units with prescribed premia and discounts. The average salary is 360 roubles per month for a watchman or a mate, 1,000 to 1,100 roubles a month for a worker in repair shop, 1,100 to 1,200 roubles per month for a Deputy Director and 2,000 roubles per month for the Director. All are provided with free houses and also get special bonus besides their normal wages. All the workers are entitled to annual leave for 15 days and the best workers are entitled to free transport, boarding and lodging in one of the health resorts maintained by the State. There are a school, a kindergarten, a library and a creche in the M.T.S. We paid a visit to the creche of the M.T.S. which appeared to be quite a decent and well managed one. When the women workers go to work they leave their children here. At the time when we visited, there were 46 children. They remain at the creche for about 9 hours a day and the mothers have to pay about 60 to 120 roubles per month according to their

income. The M.T.S. also provides a tea shop for the workers which, however, was not so good. It gave the appearance of an average tea shop in an Indian bazar and had rather poor furniture. We saw a few people drinking tea and munching brown bread. We were told that the price of one cup of tea was 20 copecks, and one kilo of bread cost 80 copecks. We also visited the repair shop of the M.T.S. which seemed to be quite a big workshop but not so well organised.

4. At the time of our visit most of the tractors were out on the fields. But we also saw a number of tractors, combines and electric tractors being repaired. We were told that almost all the tractors and combines were very strong and gave quite a good service. The average life of a tractor is about 10 years and average loss in tractor hours for repairs amounts to about 12 per cent. Besides the Central Repair Shop which we saw there were small mobile field repair stations connected by radio-telephone which could be sent to the field for carrying on minor repairs in case of break-down. We were told that the cotton harvesters were working quite satisfactorily but the electric tractors were still in the stage of experiment.

Charges.

5. The M.T.S. has sufficient number of tractors to plough up all the lands under its charge in 10 days. It enters every year into an agreement with the neighbouring collective farms and takes responsibility for all mechanical work required by them. There is a small committee comprising of the leaders of the collective farms and the M.T.S., which supervises the work of the M.T.S. and disputes between the M.T.S. and the collective farms are settled by the District Soviet. The M.T.S. not only provides machines and services but also prepares plans for supply of fertilizers, seeds, etc., and gets supplies from the Government for the collective farm. The collective farm in its turn pays the M.T.S. a certain amount primarily in kind but under certain circumstances also in cash. Last year the M.T.S. which we visited received from the six collective farms under its charge about 18,981 centners of cotton by way of payment besides some vegetables, milk, etc. The rate for ploughing amounted to 34·4 roubles per hectare. Its total income last year was 3,020 thousand roubles. This year its total income is estimated at 2,660 thousand roubles, the reduction is primarily due to the lowering of rates charged for services rendered by the M.T.S. The workers of the M.T.S. have a small collective farm of 10 hectares in which they grow vegetables for their own use.

Some relevant data.

6. We collected some data about—

(i) standard equipment for a typical M.T.S. working on 10,000 to 15,000 hectares of land;

(ii) standard equipment of a standard workshop attached to such an M.T.S. together with a list of repair jobs which the M.T.S. workshop is supposed to carry out according to prescribed norms;

(iii) break-up of repairing charges and norms for repairs to tractors; and

(iv) sanctioned strength of establishment in a typical M.T.S. and their salaries. (These may be seen at Appendix III).

General Impression.

7. The report that was given to us about the work done by some of these M.T.S.'s was no doubt impressive. But the equipment of most of the M.T.S.'s that we visited fell short of the above standard. The lay-out, buildings, upkeep of machinery, etc. of some of the M.T.S.'s were also rather poor. The difference between these and the model M.T.S. which was shown at the Agricultural Exhibition in Moscow, was very great. In fact the Yangi Yulskaiya M.T.S. which we have described above was one of the best field M.T.S.'s that we saw in U.S.S.R. Although in size, number of machines and strength of personnel, it was much bigger a unit than the M.T.S. that we saw in Czechoslovakia, the latter presented a much better picture so far as lay-out, upkeep of machines and general standard of efficiency were concerned. Possibly the Russians suffer from the usual disadvantages of pioneers and those who came later found it easier to improve upon them. But if India decides to set up machine tractor stations to help co-operative farms and also individual farms, she would do well to study the experiences of Poland and Czechoslovakia and Italy rather than those of U.S.S.R.

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CHAPTER XI

STATE FARMS IN U.S.S.R.

Although the major part of agriculture in U.S.S.R. is carried out in collective farms with the help of Machine Tractor Stations, the State farms have, as has been explained in Chapter VIII, a key position in the agricultural system. As compared to 94,000 collective farms having a total area of 578 million hectares there are altogether 4,700 State farms in U.S.S.R. having a total area of 70 million hectares. But this is not the real index of the relative importance of the State farms in the economy of U.S.S.R. The State farms have played a key role in providing leadership in the development of the socialist agriculture. Long before the collective farms were started, the first State farm was organised in U.S.S.R. as early as in 1919. There were a number of big estates which had been confiscated from landlords and the ordinary farmers did not have the capacity at that time to run these big farms. Hence, the Soviet Government had decided to run big farms themselves and that was the origin of State farms. Later on they organised State farms in backward areas and newly reclaimed areas where collective farming was not making a good headway. Some State farms were organised in order to promote special type of farming which the ordinary collective farms were reluctant to try out. At present in Siberia and Kazakistan where virgin lands are being reclaimed in remote areas a large number of State farms are being organised. During 1954, 124 new State farms were started and in 1955 it is proposed to start another 300. Priority is being given to grain farms. The average State farm is much more mechanised and much bigger than the average collective farm. In State farms almost 100% of the various agricultural processes are mechanised. The degree of mechanisation is of course somewhat less in animal husbandry farms. The size of the average State farm specialising in grain varies from 15 to 25 thousand hectares, that of a State farm specialising in sheep breeding from 20 to 50 thousand hectares and that of a State farm specialising in dairies from 2 to 5 thousand hectares in European Russia and 6 to 12 thousand hectares in Siberia.

Ministry of State Farms.

2. We made a careful study of the organisation and management of State farms in U.S.S.R. both at the centre and at lower levels because we felt that the Russian experience may be of interest to our experts inasmuch as we ourselves are trying to organise a few State farms in places like Jammu, Bhopal, etc. As has been stated earlier, in U.S.S.R. there is a Union Ministry of State Farms in Moscow and there are similar Ministries of

State Farms at the Republics. Below the Republic level there are special Trusts of State Farms in different regions. In those Republics, however, where the number of State Farms is small, there are no Trusts and the Republic Ministry of State Farms itself directly manages the farms under its control. The Union Ministry of State Farms has altogether 550 employees at Headquarters in Moscow and about 1 million workers at all other levels down to the State farm. About 5 per cent. of this total number of workers are engaged in management, inspection, etc. Besides the Minister, there are five Deputy Ministers in the Ministry of State Farms and a Council often comprising of the Minister, the five Deputy Ministers and 4 Heads of Departments. The main Departments of the Ministry are as follows:—

(i) Land Utilization,
(ii) Livestock Farming,
(iii) Mechanisation and Electrification,
(iv) Agricultural Propaganda (including extension) and Research,
(v) Inspection of State Farms,
(vi) Economic Planning,
(vii) Capital Construction,
(viii) Material and Technical Procurement,
(ix) Finance,
(x) Wages and Labour,
(xi) Book-keeping.

Besides the above Departments, there are four Administrative Divisions for running such State farms as are managed by the Union Ministry itself and not through the Republic Ministries of State Farms. These special Departments are—

(a) Administration of Pedigree State Farms,
(b) Administration of Stud Farms,
(c) Administration of Animal Breeding,
(d) Administration for Karakul sheep.

Process of Planning. 3. The process of planning in the Ministry of State Farms is almost similar to that in the Ministry of Agriculture. Planning in the State Farms begins somewhere in June and the State Farms submit their plans to the Regional Trust early in July. The Trust discusses these plans with the various experts at the Oblast level and with the representatives of the constituent State Farms and submits a co-ordinated plan to the Republic Ministry of the State Farms by the middle of July. After a careful examination the Republic Ministry of State Farms submits its plans to the Union Ministry of State Farms early in August. The Union Ministry of State Farms submits its plans to the Government by the middle of August and simultaneously sends a copy to the Planning Commission. The Planning Commission co-ordinates the plan of the Ministry of State Farms with those of the Ministry of Agriculture and other concerned Ministries and gives its comments to the Government directly. The Government then gives its own decision in the light of which the Ministry revises its plans.

4. Planning for a State farm is, however, done in much greater detail than in the case of a collective farm. While in the case of a collective farm only broad targets are fixed these days, in the case of a State farm details regarding all products and sometimes regarding every important agricultural operation are set down in the plan itself. The Union Ministry of State Farms not only fixes the targets of production and the norms of production but also norms of wages. The latter have, however, to be fixed in consultation with the Trade Union and have to be approved by the Government. It is the main Division of Labour and Wages which determines the norms while Wages and Labour Section of the Economic Planning Division makes estimates for the purpose of planning in regard to the number of workers, the average wages, "norms" of cost of production etc. The State farms have to supply brief monthly reports and detailed quarterly reports about the volume of work done, the cost of production, the degree of efficiency, etc.

Starting a new State farm.

5. When a new State farm has to be started action is usually taken by the Republic Ministry of State Farms. But in the case of specialised farms sometimes the Union Ministry of State Farms itself takes the initiative. The first step is to send an expedition of surveyors, agronomists, zoo-technicians and engineers. After the preliminary steps have been taken a special team consisting of a Director, some Agronomists, some Engineers, Accountants and Building and Construction specialists are sent. They select the land and prepare plans for staff quarters, provision of water supply, building roads, etc. Necessary machines and funds are provided and workers are recruited from other areas. The managing personnel of new State farms are almost always experienced people from older State farms. When a worker comes from older farms to new farms, he receives an advance of 3 months' salary plus a 15 per cent. increase in pay. An attempt is made to recruit workers as far as possible from the neighbourhood but where State farms are being established in newly reclaimed areas, a large number of workers have to be imported from distant areas.

Lesnoy State Farm.

6. We saw a number of State farms in U.S.S.R. By way of illustration we give below the details about one which we saw near Leningrad. This State farm is named Lesnoy and is situated in the Stalin District of Leningrad. It has a total area of 1,200 hectares split into 3

plots. The farm has 510 large horned cattle of which 260 are milch cows, about 1,000 hens, a large number of pigs, about 80 hectares of land and 10,000 frames of hot-beds under vegetables and 60 hectares of land under food-grains. The balance is under fodder. It has also 107 bee-hives. We were told that because the farm is near the city of Leningrad it is more profitable to produce milk and vegetables. But they are having also pigs, poultry and bees because that ensures the best utilisation of the various by-products. For instance, the fodder grown in the farm and the waste of the vegetables and grain are fed to the cattle. Some of the waste of milk and fodder is fed to the pigs. Some of the waste of piggery and some of the waste of the cattle feed is fed to the poultry. The bees are kept because they not only produce honey but also help in the pollination of various crops There are altogether 500 workers employed in the farm. The total population living on the farm including men, women and children is 1,700. There are 52 buildings on the farm which include not only public houses, office and conference halls, House of Culture, etc., but also apartment houses for the workers. Some of the buildings of the farm seemed old and dilapidated. On the whole, the building of the farm did not give us a good impression. We were told that during the current Five Year Plan 21 million roubles have been provided by Government for the construction of new buildings. They are going to pull down all the old buildings and put up new buildings. During the current year they were spending about 4 million roubles for construction purposes. The total budget of the farm for the current year is 12 million roubles and the annual net income is over 1 million roubles.

Organisation.

7. At the top there is a Director who has under him a specialist for each branch of production *e.g.*, cattle breeding, dairy, orchard, piggery, poultry, fruit growing, etc. Besides, there are a Veterinary Doctor and an Assistant Veterinary Doctor. Cattle breeding has been entrusted to three brigades, each brigade is under a Brigadier and has a strength of 12 or 13 workers. The Brigadier is responsible for proper feeding of cattle in accordance with established rations, cleanliness of stables and of the cattle and for the fulfilment of the plan for milking. He is also responsible for seeing that the compulsory delivery of milk to the State is done in time and properly and also for effecting economy in cost of production. There are six brigades for the production of fodder. Each brigade has a strength of 20 to 23 members and is in the charge of a Brigadier who is an agronomist. Each brigade is again divided into teams of 4 or 5. As in a collective farm, the leader of a team works in the field while the leader of a brigade does not work in the field. but is responsible for the general planning of the brigade and supervision. Besides the above, there is a mechanical shop in the charge of an engineer. There are two tractor

brigades and one special brigade for building construction. Unlike a collective farm, the State farm does not take any help from any M.T.S. It possesses its own machines. The Lesnoy Farm is primarily a milk and vegetable farm and does not have many tractors. The main machines possessed by the farm are 9 Tractors, one Combine for grain, one Combine for potatoes and one Combine for silage, one potato digging machine and 17 trucks. Besides these, it has got a large number of ploughs and other small implements. This State farm is directly under the supervision of the State Farm Trust for the Leningrad Region. Officials of this Trust constantly supervise the work of the farm.

8. We saw some good cattle in this farm and also some poultry. They looked good but were not as impressive as we were led to believe in the Agricultural Exhibition. Some of the cattle, no doubt, gave a very high yield, for instance, one cow gave as much as 10,236 litres of milk last year and we were told that the average yield of milk was 5,198 litres during the last two years and that this year they were aiming at an average of 5,500 litres. Most of the cows are looked after by dairy maids who seemed to be very conscientious workers and kept their tables quite clean. Each girl looks after 22 to 24 cows and milks a cow 4 times a day with the help of machines. The first milking is at 5 A.M., the second at 10 A.M., the third at 3 P.M., and the 4th at 9 P.M. But there was very large difference in the productivity of cows. The cost of production of milk as planned was 1·28 roubles per kilogramme for the current year, but we were told that they have been able to reduce the cost of production to 1·10 roubles per kilogramme this year. The sale price of milk to be delivered to the State is 1·5 roubles per kilogramme. The milk is sold to the State as pure milk and no butter cream is extracted. The fat content seemed to be somewhat low say 3·46 per cent. The State in turn sells this milk from the State shops at the price of 2 roubles per litre. Unlike the collective farms, the State farm is not allowed to sell any of its products in the open market.

Greater Emphasis on State farms.

9. We did not notice much difference in efficiency between collective farms and State farms. But some of the officers whom we met tended to favour the State farm compared to collective farms. The underlying reason may be not only economic but also political. We noticed that in recent years the emphasis on State farms has increased and attempts are being made to make the collective farms conform as much as possible to the size and structural pattern of the State farms.

CHAPTER XII

FERTILISER PRACTICES IN U.S.S.R.

The Russians are making quite a large scale use of N, P & K types of fertilisers. The main chemical fertilisers used in U. S. S. R. are NH_4NO_3, $NaNO_3$, $(NH_4)_2SO_4$, $CO(NH_2)_2$, P_2O_5, $Ca_3(PO_4)_2$, $4CaOP_2O_5$, $CaH(PO_4)H_2O$,K_2O: KCl and K_2SO_4.

Nitrogenous Fertilisers.

2. **Ammonium Nitrate [NH_4NO_3—34%N].**—Ammonium Nitrate today comprises as much as 60 per cent. of all nitrogenous fertilisers used in U.S.S.R. It is used both as basic fertiliser at ploughing time and as supplementary fertiliser at the growing period for all types of crops, *e.g.*, grains, cotton, sugar-beet, flax, kenaf, etc. The dose varies according to soils and crops and climatic conditions. The average dose is 80 to 100 kgms. of Ammonium Nitrate per hectare for wheat and 240—300 kgms. of Ammonium Nitrate per hectare for cotton. For the winter wheat crop, 30 to 40 tons of organic manure (mostly F.Y.M.) is used per hectare as basic manure in autumn followed by 80 to 100 kgms. of Ammonium Nitrate per hectare during spring. For cotton, about 80 to 100 kgms. of Ammonium Nitrate is used as basic fertiliser at ploughing time and 160 to 200 kgms. per hectare is used as supplementary fertiliser during the cultivation or growing stage on irrigated soils. Until recently most of the Ammonium Nitrate used in Russia was in powder form but that created difficulty because it was hygroscopic and formed into clods and led to explosions. Now they are rapidly changing over to granulated form which is less hygroscopic and can be spread more easily with the help of machines. They are also adding certain chemicals to this granulated Ammonium Nitrate to make it less hygroscopic. The chemicals used are usually Paraffin or Gudron.

3. **Ammonium Sulphate [$(NH_4)_2SO_4$—20.9%N].**—This fertiliser is used mainly as basic fertiliser in black and grey soils which contain carbonate salts of Calcium and Magnesium. Russian scientists discourage its use in other soils as it has a tendency to increase the acid content of the soil in the long run and to reduce its fertility. Another disadvantage of Ammonium Sulphate is that it has a lower Nitrogen content compared to Ammonium Nitrate. At one time Ammonium Sulphate used to be about 50 per cent. of the total Nitrogenous fertilisers used in U.S.S.R.—now it is only 20 per cent. The Russians are deliberately encouraging the use of Ammonium

Nitrate and Urea in preference to Ammonium Sulphate. Ammonium Sulphate is now mainly used in U.S.S.R. for cotton, sugar-beet and grain crops on black and grey soils. Its dose is about 225 to 300 kgms. of salt per hectare.

4. **Urea [$CO(NH_2)_2$ —46%N].**—Urea contains the highest percentage of Nitrogen, but it is also more costly than Ammonium Nitrate. Therefore it is used only where the farms are situated at a very long distance from factories and transport is rather costly. It is usually used for all crops and on all soils where Ammonium Nitrate can be used. The dose is almost the same calculated in terms of Nitrogen content.

5. **Sodium Nitrate [($NaNO_3$)— 14%N].**—It is considered to be a valuable fertiliser for sugar-beet and fodder-beet, although it is used to a very small extent for wheat also. The dose of this fertiliser is 300 to 400 kgms. of salt per hectare, used partly at the time of ploughing and partly at the time of sowing and growing.

6. **Liquid Ammonia.**—Russians tried to use liquid Ammonia 15 years back but their experience was not very successful. One of the main difficulties was transport. Russian scientists think that it is much better to use Ammonia in the form of Nitrate or Sulphate rather than in the liquid form. In fact they strongly recommended Ammonium Nitrate and Urea as the most convenient forms of Nitgrogenous fertilisers to be used under Indian conditions. They feel that these are not only most economic but also very useful in the sense that they form the very basis for a heavy chemical industry. Their use would also mean avoidance of a considerable wastage of Sulphuric acid which is involved in the manufacture of Ammonium Sulphate.

Phosphatic Fertilisers

7. **Super Phosphate [(P_2O_5)—20% P in powder form and 21.5 % P in granular form].**—This is manufactured mostly from rock phosphate (5 per cent. to 30 per cent. P_2O_5) and Appatit (30 per cent. to 35 per cent. P_2O_5). The Russians are now using largely the granulated form of this fertiliser as that can be used more easily with machines and is also convenient in the sense that it does not unite easily with salts like iron, kalium, etc. present in the soil. The dose is 45 to 60 kgms. of P_2O_5 per hectare for grains. Of this quantity about 10 to 15 kgms. are used as raw manure and the balance is used as basic manure during ploughing time. For the cotton crop the dose is 80 to 100 kgms. of P_2O_5 per hectare, 75 per cent. being used as basic manure and 25 per cent. at the time of cultivation. One interesting development in U.S.S.R. is that they are now using in certain areas 5 to 10 per cent. solution of P_2O_5 in water for spraying on leaves of cotton and sugar-beet in particular and to a smaller extent also of grains, one or two times—a few weeks

Spraying of Phosphatic salts on leaves.

before harvesting. They claim that the plants absorb this fertiliser solution through leaves and it assists in the maturing of the crop and in fact increases the yield of the crop appreciably. The fact that some chemical fertiliser can be absorbed by plants through leaves is said to have been proved by the Russian scientists through the use of radio-active isotopes of these salts. We found, however, some difference of opinion in regard to this. While some scientists had no doubt about the efficacy of this method, others told us that the whole thing was still in an experimental stage and results had yet to be confirmed. We were told in the Farghana area that they are trying out this method of spraying solutions of phosphate salts on the leaves of the cotton plant on 20,000 hectares this year.

8. Other phosphatic salts used by the Russians are:—

(i) Phosphoric flour $Ca_3(PO_4)_2$—used mostly on black soil and in very poor ash soils,

(ii) Tomaslak ($4CaOP_2O_5$)—18 per cent. P_2O_5,

(iii) Double super phosphate (40 per cent. P),

(iv) Precipital $[CaH\ (PO_4)_2H_2O)]$—30 to 40 per cent. P_2O_5,

(v) Bone Powder.

These fertilisers, especially Bone Powder, are now being used in very small quantities only.

Potassium Fertilisers.

9. **Potassium fertilisers.**—The Russians are mainly using products of sylmanite obtained mostly from Soliknask in Urals and Lvev in Ukraine *e.g.*, Potassium Chloride (KCL—48 to 60 per cent. K_2O) and Potassium Sulphate (K_2SO_4—42 to 52 per cent. K_2O). The K salts are mainly used for cotton and grains in addition to N and P salts. We were told that where by using only N and P salts one gets 35 centners of cotton per hectare, by adding K salts the yield can be increased to 40 centners per hectare. Similarly the yield of grains and vegetables can be increased by 30 to 40 per cent. by using K salts in addition to N and P salts.

Micro Elements.

10. Russians are also making use of micro elements like Boron (mostly Bor which contains 80 per cent. of Boron), Manganese (mostly Manganese alum which is a by-product of the Manganese industry) and Copper (mostly pyrite) as fertilisers in addition to N, P and K salts. The use of Bor on cotton plants has been found to be very effective especially for seeds. It is mainly used in mixture with Super Phosphate. The dose is 1 kgm. of Bor per hectare for cotton and ½ kgm. per hectare for Clover or Lucerne. It is claimed that use of Manganese improves the growth of beets and potatoes. The dose is 1 kgm. of pure salt per hectare. Copper is used mainly in newly reclaimed marshy lands which are

short of copper salts. The dose is 25 kgms. of Copper Sulphate or 300 to 400 kgms. of pyrite per hectare. While Bor has to be put in the soil every year, copper and manganese salts once applied remain effective for three or four years.

Bacterial Solutions.

11. The most interesting development in the field of fertilisers that we found in U.S.S.R. is the inoculation of seeds with bacterial solution or as they call it the use of bacterial fertilisers. There are three types of these bacterial fertilizers in use:—

(1) Nitragin,
(2) Azotabacterin, and
(3) Phosphobacterin.

12. They are trying to develop a fourth type of bacterial fertilizer which they call Kalibacterin. But this is still in an experimental stage. At present Nitragin is being used in about 2 million hectares of land, Azotabacterin in about 1 million hectares of land and Phosphobacterin in about 6 million hectares of land.

13. Nitragin is used mainly for legume crops. There are about 12 different types of Nitragin used for different types of legume crops *e.g.*, clover, beans, lucerne, green manures, peas, soya, groundnuts, etc. About ¼th litre of Nitragin is used per hectare. Sufficient water has to be mixed with it to soak the seed which is required for 1 hectare of land. The soaking is done a few hours before actual sowing. Even in the relatively hot climate of Uzbekistan, Nitragin has been quite successful. It is said to increase production usually by 15 to 20 per cent. A bottle of Nitragin sufficient to cover one hectare of land is sold at 3 roubles. Nitragin can be used in all soils. If, however, the soil is acidic, the use of lime is recommended. A culture of Nitragin once prepared remains active for a period of 9 months. Although Nitragin can be used by itself, the Russian experience is that it produces the best result in combination with small quantities of chemical fertilisers. Too heavy a dose of chemical fertilisers may, however, have adverse effects on it. The dose varies from crop to crop. We are, however, giving below the dose for clover sown in rotation with grain in non-black soil as an illustration. For this crop, in autumn about 20 tons of organic manure or compost plus 200 to 300 kgms. of Super Phosphate plus 100 kgms. of Potassium Chloride are put into the soil at the time of ploughing in autumn. During sowing of grains about 50 kgms. of Super Phosphate are put per hectare in rows with the help of sowing machines. In the following spring about 60 to 100 kgms. of Ammonium Nitrate are put in the soil per hectare. Then clover seeds soaked in Nitragin are sown and about 150 kgms. of Super Phosphate and 50 kgms. of Potassium Chloride per hectare are again put into the soil. As is well known, in legume

crops there are some bacteria in nodules of roots which help absorb Nitrogen from air and make it available to the plants. Nitragin accelerates this process.

Azotabacterin.

14. Azotabacterin is a species of bacteria which is used in all types of non-leguminous crops mainly wheat, vegetables, potatoes, oilseeds, hemp, cotton, etc. It absorbs Nitrogen from air and feeds these non-leguminous crops with this Nitrogen somewhat in the same manner as the legume crops absorb Nitrogen. It is most effective in neutral soils. It can be used in acid soils but its effectivity is then very much smaller. Acid soil has to be neutralised before using Azotabacterin. In grey soils there already exist some bacteria and it is considered unnecessary to use artificial Azotabacterin. About ½ litre of Azotabacterin is used per hectare after mixing it in water sufficient to moisten the seed to be sown in one hectare of land. Formerly humus or peat was used as the basal medium, now only Agar is used. Price of one bottle of Azotabacterin containing about ½ litre is about 3 roubles. Generally speaking, Russians claim that Azotabacterin by itself leads to an additional production of 10 to 15 per cent. In fact the following increase in production has been noticed in the case of different crops *e.g.*, spring wheat 130 to 150 kgms. per hectare, winter wheat 130 to 210 kgms. per hectare, oats 240 kgms. per hectare, potatoes 1,500 to 2,800 kgms. per hectare, cabbages 4,000 to 6,000 kgms. per hectare, sugar-beet 1,200 to 2,500 kgms. per hectare. Azotabacterin culture once prepared remains potent for a period of about 9 months. This bacteria is not really a new one but was first isolated by a Dutch Scientist called Byering. It is only in U.S.S.R., however, that large scale use of Azotabacterin is being made. Originally Russian Scientists had expected even higher yields from the use of Azotabacterin but now they find that the average increase in yield is only 10 to 15 per cent. although in some cases it may go up to as high as 30 per cent., in other cases the additional production may be negligible even below 2 per cent. The main advantage of Azotabacterin is that it is very cheap. The Russian scientists, therefore, recommend that it should be used not as a substitute for chemical fertilisers but in combination with the latter. Two typical illustrations of Azotabacterin used in combination with chemical fertilisers are given below:—

15. **Spring Wheat.**—During autumn ploughing, 200 to 300 kgms. of Super Phosphate and 100 kgms. of Potassium Chloride per hectare are put into the soil. During the following spring about 100 to 150 kgms. of Ammonium Nitrate per hectare are put into the soil and about 50 kgms. of Super Phosphate are used in rows at the time of sowing. The seeds are soaked in Azotabacterin before sowing. It

is found that combination of Ammonium Nitrate or Super Phosphate in above doses alongwith Azotabacterin does not reduce the effectivity of Azotabacterin in any way.

16. **Potatoes.**—At the time of ploughing in autumn about 20 tons of organic manure together with 200 to 300 kgms. of Super Phosphate and 50 to 100 kgms. of Potassium Chloride per hectare are put into the soil. In spring 100 kgms. of Ammonium Nitrate per hectare are put in the soil when reploughing is done. About 100 kgms. of granular Super Phosphate are then used alongwith potato seeds while planting is carried on. Potato seeds are soaked in Azotabacterin solution before planting.

Phosphobacterin.

17. **Phosphobacterin.**—Phosphobacterin is used mainly in such soils which contain lot of organic matter containing phosphate in a form which is not normally assimilable by plants. Phosphobacterin converts these salts into assimilable forms. Phosphobacterin can be used for all crops. Once prepared the solution will remain for a long time, if kept away from light—even for two or three years. Usually about 50 c.c. of Phosphobacterin solution is required for one hectare of land. It is used in the same manner as Azotabacterin and Nitragin, the culture being mixed with water sufficient for moistening the seed to be sown. Phosphobacterin is not effective in very poor soils, in soils which contain very little organic matter especially grey soils. It is most effective in black soils and marshy soils. The fertiliser practice is almost the same as in the case of Azotabacterin. The effectivity of Phosphobacterin is increased if it is used in combination with Super Phosphate. We were told that without Super Phosphate Phosphobacterin by itself increases the yield of wheat by 100 to 200 kgms. per hectare. In combination with Super Phosphate it increases the yield of wheat by 300 to 500 kgms. per hectare.

18. Kalibacterin is still in an experimental stage. A group of scientists under the guidance of Prof. Alexandrov of the Institute of Soil Micro-biology of the Russian Academy of Sciences is now engaged in these experiments.

19. The officers of the Agriculture Ministry and collective farmers whom we had questioned about these bacterial fertilisers said that these fertilisers have been found to be very useful and more or less confirmed the increase of yield which has been mentioned above. On the other hand some scientists *e.g.*, Academician Zukovski said that the use of all these bacterial fertilisers is still experimental and it is not possible to say with any degree of certainty that these will give satisfactory results under all soil conditions and all climates. They feel that 10 to 20 per cent. additional yield which has been reported by farmers is only for very favourable soil and climatic conditions.

20. We tried to get some samples of these bacterial fertilisers and Mr. K. P. S. Menon, our Ambassador in Russia, put in an official request for these samples. At one time we had hopes that we would get the samples before we left Moscow. In fact the scientists concerned showed us the bottles which they said they would be sending through the Ministry. But then something happened somewhere and at the last moment we were told that unfortunately the samples were not available.

21. From what we saw in U.S.S.R. we feel that they are doing very good work in the field of fertilisers and fertiliser use. We would suggest that the Government of India should make an attempt to get under the U.N. Technical Assistance Programme the services of an expert like Academician Samailov or Prof. Alexandrov of the Institute of Soil Micro-Biology or Prof. Prienichnikov of the Agrochimia, for about six months or so. In the alternative one or two of our senior experts should be sent to U.S.S.R. to work in the U.S.S.R. Institute of Soil Micro-Biology.

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CHAPTER XIII

IRRIGATION, DRAINAGE AND LAND RECLAMATION IN U.S.S.R.

Irrigation.

In the Soviet Union considerable emphasis is being put on irrigation, drainage and land reclamation. The Soviet authorities are using not only flow and lift irrigation but also sprinkler irrigation on a fairly large scale. Besides irrigation, the Soviet authorities have also undertaken large scale drainage and reclamation of marshes and bogs. We had the opportunity of seeing for ourselves irrigation works in the Volga Don basin and Farghana Valley of Uzbekistan.

Volga-Don Canal.

2. The Volga-Don Canal is indeed a remarkable engineering job of which any country can be rightly proud. Formerly a large volume of the surplus water of the Don River used to flow out to the Black Sea and was not only wasted but also caused frequent floods. The Soviet authorities decided to connect the Don river with the Volga river and use the surplus water of the Don not only for irrigation purposes but also for navigation. For, both the Black Sea and the Don could be then connected not only with the Volga and the Caspian Sea but also with the Baltic sea and the North sea through the Volga and the Moscow-Leningrad canal system. The main problem however, was that the water of the Don river had to be pumped up to a height of 44 metres and then brought down by 88 metres to reach the level of the Volga river. This necessitated the building of a number of powerful pumping stations and lock gates. Although the scheme was in contemplation for a long time, work could be started only after the Second World War. The actual construction of the various dams was started in 1948 and was completed in July, 1952. By damming the water of the Don river an artificial lake has been created which is called the Smolensky Sea. The water of this lake is pumped up by a series of pumping stations to a height of 44 metres. The first pumping station lifts the water by about 11 metres to a reservoir called Karkhov Reservoir, the second pumping station by about 22 metres to another reservoir called the Slaskov Reservoir and the third pumping station by 11 metres to a third reservoir called Barbavskaya Reservoir and so on. The highest point on the Volga-Don canal is 44 metres higher than the water level of the Don river and 88 metres higher than the water level of the Volga river. After the highest point is reached the water is let down gradually through a number of lock gates. The amount of concrete used was 1 million cubic metres for the canal and

3 million cubic metres for the Smolensky Sea and the Reservoir. The canal has a length of 101 kilometres. The canal at present irrigates about 15,000 hectares and the Smolensky Sea irrigates another 100,000 hectares. It is expected that very soon several hundred thousand hectares of land will be irrigated by the Volga-Don canal system. At present about 500,000 tons of shipping passes through the canal every year, but it is expected to increase many times in the near future. At present boats upto 3,000 tons can pass through this canal. Russians are, however, deepening and widening the canal to allow larger boats to pass through. We travelled up the Volga river and the Volga-Don canal to a distance of about 30 kilometres by motor-boat and were most impressed by what we saw. We were also shown the working of the lock gates. The whole system is completely mechanised and is very well organised indeed.

Farghana Canals.

3. The second irrigation system that we saw was at Farghana and is very different from the Volga-Don system. If the Volga-Don canal is a masterpiece of engineering skill and mechanisation, the canal system of Farghana is the product of human labour mobilised through popular enthusiasm. It is primarily flow irrigation and there is not much of mechanisation here. But what is interesting is that the entire system of canals and distributaries were built by the voluntary labour of villagers themselves.

4. It appears that the Farghana valley used to suffer very frequently from drought. Towards the end of the thirties the Soviet authorities decided to remedy the situation by constructing a system of three canals and a number of distributaries. At that time the supply of excavators and earth moving machines was rather short. Therefore, it was decided to appeal to the people to contribute their labour for the construction of the canal. The present Deputy Minister of Irrigation of the Uzbek Republic, Mr. Karzarin, who was at that time working as an engineer in the Ministry was put in charge of the work. The experience that he described to us was very interesting. He said that he and his technical staff completed all surveys by 1938 and prepared detailed plans of the barrage, the canal, lock-gates, etc. These plans were sub-divided into a number of small sectional plans. One batch of the technical staff undertook to construct such items like lock-gates, bridges, concrete works, etc., which required high technical skill. The other batch of the technical staff under him was entrusted with guiding the voluntary labourers who were asked to carry out such unskilled work as digging canals, building roads, preparing earth work for the barrage, etc. Arrangements were also made for receiving the people who would be coming from a distance to contribute their labour and for providing camps, kitchens, etc. for them. Then an appeal was issued by the Government to the local people for contributing their voluntary labour. Mr. Karzarin said that he had never had a more

exciting time in his life. Thousands and thousands of people all over the country came by foot, by car and by train paying all their expenses themselves and vying with each other for contributing their labour. Each group from a particular village came with its own food and marched all the way singing songs. They came in such large numbers that Mr. Karzarin at one time felt obliged to request some of them to go back. But no one would listen to him. They bivouaced near the canal site and the whole area looked like a big fair. Mr. Karzarin had given orders that work should not start before a particular date. But the people could hardly wait. They persuaded the supervisors to show them the particular areas where they were supposed to work and started work as soon as they arrived. Mr. Karzarin had ordered that no one should work more than 8 hours, but his orders were disobeyed. People were working upto mid-night in the light of torches. The job of supervisors was no longer to make people work hard but to persuade them not to work too much. The crowd was all through in very good humour and tried to follow scrupulously the various technical directions which were given by the supervisors. There was such an enthusiasm created in the whole country side that people began to come to Farghana from places hundreds of miles away. The Tashkent Opera Party came and camped near the canal site and gave every night a performance for the benefit of the voluntary workers. Similarly singers and artistes from various parts of the country came to entertain the workers. Thus in four months' time the canal system and the distributaries were dug by the people themselves in half the time that Mr. Karzarin and his technical colleagues had originally estimated it would take. Mr. Karzarin said that now that they had enough machines and equipment—bulldozers, excavators and earth moving machines—the Soviet authorities had given an order that no human labour should be used for such work which could be done by machines. This was certainly a step in in the right direction and they no longer dig canals with human labour but only with machines. But Mr. Karzarin still looked wistfully back to the days when the voluntary workers of Farghana and Uzbekistan dug this big system of canals in the Farghana Valley just as if it were a part of a national festival.

5. The great Farghana Canal itself which is 340 kilometres long and irrigates as much as 225,000 hectares was built in 45 days by 180,000 voluntary workers. Besides the great Farghana Canal, there is a North Farghana Canal and the South Farghana Canal and a large number of distributaries which form part of the irrigation system of this valley. We have mentioned here the irrigation system of Farghana not because it is a very spectacular thing like Volga-Don canal or it is an engineering marvel. In fact we have bigger and better canals in U.P. and Punjab. But the interesting thing about this canal system is the way in which it was built

by the voluntary labour of the people by using only shovels and spades in an extraordinarily short time.

6. Thanks to this system of canals, the Farghana valley which was at one time a desert is now the most fertile area noted for its production of cotton. The yield of cotton in this valley is amongst the highest in the Soviet Union. We were told that similar canal systems are being built in many parts of the Soviet Union.

Sprinkler Irrigation,

7. A large number of diesel pumps are also being used in Russia to pump the water of rivers and canals and wells into the fields. Since the last War a large number of sprinkler irrigation equipment have also come into use. The diesel pumps and the sprinkler irrigation equipment which we saw in operation seemed to be quite good. Where the water supply is relatively scarce and it is necessary to have a greater economy in the use of water or where the soil is such that there is danger of water logging from flow or lift irrigation, sprinkler irrigation is being encouraged. Although sprinkler irrigation is somewhat more costly compared to flow or lift irrigation, in the long run it becomes more economic especially in the above two types of areas because it ensures a more controlled use of water.

8. The various equipment and machinery which we saw being used in U.S.S.R. for various types of irrigation appeared to be quite efficient and up-to-date. Out of the various machinery which we saw we feel that the following are worth giving a trial in India:—

(i) Spray irrigator for large fields.
(ii) Spiral pump—5 stage—80 cubic metres.
(iii) Dredging machines.
(iv) Deep well pumps.
(v) Dry boring and wet boring drilling rigs.
(vi) Self Soaking pump—8 kilometres.

Reclamation of Land.

9. Large scale attempts are being made all over U.S.S.R. to increase the area of usable crop land. In fact one gets the impression that the Russians are relying on extensive cultivation much more than intensive cultivation for solving their agricultural problem. One reason is that Soviet Russia has a large reserve of potentially cultivable land. A second reason is that land reclamation is not only a mere spectacular type of work which appeals to the Russian mind but is also easier to organise and control compared to intensive cultivation where individual incentive plays a large part. A third reason is that large areas were abandoned during World War II which required large scale reclamation operations now.

10. The reclamation work is mainly confined to clearing of scrub jungle or drainage of swamps of which there are quite large areas in U.S.S.R. Virgin forests are usually left untouched. The oldest forests under clearance are only 10-12 years of growth. The work is being done in the following order :—

(i) Felling of trees with portable saws (electrically operated).

(ii) Rooting out all stumps to a depth of 70 centimetres and clearing of bush growth which in such areas does not usually exceed in intensity of 14 bushes per square metre.

(iii) Ploughing to a depth of 30 centimetres.

11. In U.S.S.R. there is no serious problem of weed or any other type of pernicious grass. Only in certain areas there is a type of weed known as 'QUIGE' which is harmful to the growth of crops. This is easily eradicated if the area infested is ploughed 30 centimetres deep and the roots are exposed to dry out. The area is then levelled and the land is kept under the plough year after year. Reinfestation after reclamation does not present any problem.

Reclamation of Saline Marshy Lands.

12. Large scale reclamation of bogs and marshes covered with scrubs and wood is being carried on in 7 regions in Byelo Russia, 4 regions in Ukraine and 3 regions in Uzbekistan. The bulk of the reclamation work is done by machinery. The equipment for this project is placed under the charge of mechanised land improvement Trusts. The brigades for carrying out the work are organised by the Central Ministry and are entrusted with definite assignment of the work. The machinery provided is based on prescribed norms of work and the total amount of work involved and the period in which it has to be completed. Some of the important norms for this type of work are given below:—

Scraper—800 Cubic Metres per day of 8 hours.

Ditch digging machine—6 kilometres per day of 8 hours.

The machines provided for this work consist of:—

(1) Excavators.

(2) Special pumping sets.

(3) Bull-dozers and Scrapers (Scrapers provided were in three different sizes *i.e.* with 1·5, 1·75 and 1 Cubic metre capacities).

Procedure.

13. The procedure of reclaiming saline marshy lands adopted in U.S.S.R. is as follows:—

(i) Deep drains known as Trunk Canals approximately 10 km. long and 4 to 5 metres deep, depending upon the relief of the land, are first constructed with the help of excavators. These drains are joined to a canal for the supply of water in the area and are constructed at suitable distances apart.

(ii) Small drainage canals known as collector canals about 2·5 to 3 metres deep and with average length of 3 to 3½ kilometres are excavated at distances varying between 50 to 300 metres (sometime 500 metres) which are joined to the deep drain carrying the canal water. Distance between drains is determined by the underground quantity of salt water and seepage.

(iii) All salt water collected in the collector canals flows to the trunk canal which is either taken to a reservoir or to the source of the river from which the canal obtains its supply of water.

(iv) Generally a Hydro-Electric Station is subsequently established for irrigation purposes.

(v) After the soil is drained the irrigation and washing of the soil is carried out with the main canal.

In the 1st year after reclaiming.	8,000 to 12,000 cubic metres of water is necessary for irrigation and watering of soil depending on the salt contents in the soil.
In the 2nd year.	Washing of the soil has again to be carried out.
In the 2nd or 3rd year.	The land is fully reclaimed and becomes fit for cultivation.

14. In areas having lesser salt contents in the soil, the first year's washing itself overcomes the salinity, but in more salty soils, 2 or 3 washings are necessary before fertility of soil is restored. In more difficult areas construction of small drains 60 centimetres deep at distances of 50 to 60 metres becomes further necessary. These drains are levelled with dozers after washing of the soil is completed.

Cost. 15. The cost of reclamation on such areas works out to 7,000 roubles per hectare, which includes cost of laying drains, canals, washing of soil and construction of reservoir. The cost of constructing ordinary earthen channels and reclamation of land comes to 2,000 to 3,000 roubles per hectare depending on the relief of the land.

CHAPTER XIV

TRACTORS AND AGRICULTURAL MACHINERY PRODUCED IN U.S.S.R.

The production of tractors and farm machinery in U.S.S.R. dates back to the year 1930. The first tractor producing plant was established at Stalingrad in 1931. The major tractor producing factories are located at Stalingrad, Kharkhov, Chelyabinsk, Rubtsonsk (Altay Territory) Lipetsk, Vladimer & Minsk. There are in all 9 principal types of tractors produced in the country, which are classified in three different categories. The following are the main types of tractors produced:—

Main types of Tractors.

1. S. 80.
2. DT. 54.
3. KD. 35.
4. KDP. 35 (Row crop & Bellaruse wheel type).
5. MTZ. 1 & MTZ. 2.
6. MTZ, 7.
7. KT. 12, (gas).
8. Y1, Y2, Y3, Y4.
9. KTZ Electric.

2. These tractors are classified into the following 3 broad categories. (The detailed specifications of the first seven types of tractors are given in Appendix IV) :—

(a) All purpose;
(b) Special purpose;
(c) Universal.

All purpose tractors are generally meant for heavy work, such as bulldozing, grading of roads, excavating, ditch making, working 5 furrow M. B. Ploughs in tandem for ploughing and reclamation of lands.

The special purpose machines are utilized on ploughing of land at sowing time, breaking up of soil, general cultivation work (ploughing, harvesting, seeding and cotton cultivation), cultivation between rows and sowing of industrial crops and working combines and other heavier machines.

The universal type of tractors are used on light works in agriculture such as ploughing of garden plots, working of tooth pick harrows, running small centrifugal pumps, etc.

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Each type of tractor has a norm of work specified in terms of output of work, fuel consumption, period when it becomes due for major overhauling and minor repairs, etc. These norms are laid down by the Ministry after extensive tests and trials by experts and have to be strictly adhered to.

Production.

4. In the post-war period Soviet industry has considerably increased the production and variety of machines introducing new and improved types of diesel and crawler tractors. The total number of tractors in agriculture used in 1954 is 1,260,000. The production of tractors during the post-war period may be seen from the following figures:—

1946—52. .	956,000 tractors.
1953 . .	150,000 tractors.
Planning production upto 1956.	500,000 15 H. P. Type, 250,000 Row crop types, besides others.

Producer Gas Tractors.

5. Special mention may be made here of Producer Gas and Electric Tractors, which have recently come under production in U.S.S.R. The 45 H.P. track type K.T. 12 is a 4 stroke producer gas tractor which uses wood as fuel and peat bricks for generating producer gas for working the engine. The tractor is suitable for working in regions rich in wood and forest areas. These tractors are particularly in use in Siberia and certain places in Ukraine and have been found very economical to operate.

The Electric Tractor.

6. For a long time the Soviet engineers and scientists had been interested in using electric power for farming. They had in mind the use of electric tractors because of the tremendous economy of oil and lubricants in their operation. Few years back several experimental models of electric tractors were manufactured by the research workers of the Power Institute of the U.S.S.R. Academy of Sciences and Institute for Agricultural Electrification. Proceeding from these experimental machines, the Soviet industry has developed electric tractor of an improved design which only started working in a few M.T.S.s in the spring of 1954. The new electric tractor unit KTZ 12 has a closed cabin and has an improved system of laying and winding up of the cable. It is equipped with a travelling transformer sub-station to step down the high tension current from the field power transmission line. Without changing its power line connections, the tractor can work an area upto 550 acres. The driver switches the sub-station voltage directly on the tractor. Semi-automatic push button control and the absence of exhaust fumes and noise makes the driver's work lighter and more pleasant. The tractor does away with the need for water and fuel. The quality of ploughing from this tractor is also said to be deeper and more uniform and the seed distribution more even. These tractors have found use

chiefly in the vicinity of large Hydro-Electric plants where some electric machine and tractor stations are being set up. Electric tractors can be worked at a distance of 1,500 metres from the Electric Mains and for this purpose transmission lines on farms where electric tractors are in use are provided at distances of 3,000 metres. It has a 44 K.W. capacity unit, which works on a transformed voltage of 1,000 volts. The economy from an electric tractor in the use of fuel alone comes to 25 tons of fuel per year.

Stalingrad Tractor Factory.

7. The Stalingrad Tractor Factory which produces D.T. 54 Diesel Crawler Tractor was visited by us on the 20th September, 1954. The plant produces 70 tractors per day and has since 1930 produced 600,000 tractors from its 3 plants. This particular type of tractor is extensively used in U.S.S.R. on all collective and State farms for ploughing and general cultivation and sowing purposes. The tractor is capable of ploughing 75 hectares per hour of land with a 4 bottom M.B. Plough and has a rated output of 54 H.P. with 36 H.P. at the Drawbar. The fuel consumption is guaranteed to be 220 grammes per H.P. hour.

The factory has been planned and works on mass production system and precision tests are carried out at every stage of production and assembling. The engine undergoes a Dynamometer Test for 1 hr. and 45 mts. and the tractor is tested under full load for 2 hours before it comes out from the factory and carries a guarantee of 2,000 working hours.

The performance of this tractor compares very favourably with any of the British or American machines of similar H.P. and it looks very sturdy in its constructional details. The finish of the tractor is, however, not so attractive presumably because the Russians are not producing for a competitive market.

Development of Agricultural Machinery.

8. Soviet production of tractors, combines and other types of agricultural machinery has grown very rapidly since 1930. This growth of production is indicated by the following figures:—

1940 — 100 (assumed)
1950 — 173
1953 — 250

Many large plants have been put into operation. Among the major farm machinery plants are the factories at Stalingrad, Rostov, Saratov and Lynberty (Moscow Province) and the Giant Agricultural Machinery Factory at Rostov. Other post-war plants have been built at Lipetosk, Vladimir and Minsk. The Stalingrad and Kharkhov factories, which were destroyed during the War have been restored and put into operation again. The farm machinery industry is building a large variety of machines, and has introduced new and improved types of diesel and crawler tractors, self-propelled combines, cotton pickers, sugar-beet harvesters and a wide range of other equipments. Practically all types of agricultural operations in U.S.S.R. are now done with the help of machines. In general, agriculture in Soviet Russia has been mechanized to the extent of 98 per cent. The Soviet agriculture uses as many as one thousand different types of agricultural implements produced by the Soviet Machine Building Industry. Most of these types of implements have been displayed in the U.S.S.R. Agricultural Exhibition at Moscow.

9. The basic idea behind this development is to replace manual effort in the laborious work of agriculture and to cut down the demand of man power in agricultural farms. With this object in view machines for various agricultural operations have been developed in large numbers. A detailed list of such machines will be found in Appendix V.

10. The general procedure followed for the development and production of agricultural machinery in U.S.S.R., may be outlined as follows:—

(i) The Agriculture Ministry gives the specifications and requirements.

(ii) The demand is placed on the Ministry of Production.

(iii) The Special Construction Bureau designs the implements.

(iv) Experimental machines are sent to Testing Stations and Research Institutes for extensive tests and trials.

(v) After they are certified as fit, the Ministry of Agriculture gives its approval.

(vi) Mass production is started.

(vii) Modifications if found necessary are carried out subsequently.

11. We visited the Rosselmash Agricultural Equipment Manufacturing Factory at Rostov and the Agricultural Equipment Manufacturing Factory at Tashkent. These factories are producing various types of agricultural implements in large numbers. The Rosselmash factory alone was producing about 70 Harvester Combines per day. We

also visited the Middle Asian Scientific Research Institute of Mechanisation and Electrification of Irrigated Agriculture at Tashkent where a number of agricultural implements were under test. We were given demonstrations of Spray Irrigator and Cotton Harvesting machines with artificial spindles at this Institute.

12. Our general impression is that the agricultural machinery in U.S.S.R. is very sturdy and quite efficient. But most of the machinery is meant for very big farms only and will not be suitable for small farms.

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CHAPTER XV

AGRICULTURAL RESEARCH, EDUCATION AND EXTENSION IN U.S.S.R.

In U.S.S.R. a very high priority is given to research. There are over 2,500 research institutes and stations in the country. On agricultural research alone 500 million roubles are being spent every year and more than 10,000 specialists are working in various Research Institutes and Laboratories. There are 20 Institutes attached to the Academy of Sciences and the Lenin Academy of Agricultural Sciences, most of which specialise in fundamental research in agriculture, animal husbandry and related subjects. Besides these, there are over 140 Research Institutes under the Union Ministry of Agriculture and 6 Institutes under the Union Ministry of State Farms which are engaged on applied research. These are supplemented by about 1,000 experimental stations in various parts of the country.

2. We had the occasion to visit the Lenin Academy of Agricultural Sciences which concentrates primarily on research and the Timiriazev Academy of Agriculture which concentrates on teaching in Moscow, the Institute of Botanical Research and the Lenin Institute of Plant Breeding, Leningrad and the Institute of Cotton at Tashkent. The conditions of agriculture in U.S.S.R. differ very much from those obtaining in India and hence it may not be possible to derive much benefit from the work that they are actually doing. But there are a few fields where a closer collaboration between our Scientists and the Soviet Scientists may be of considerable value to us if only it helps to draw the attention of our Scientists to new lines of research. We felt from what we saw in U.S.S.R. that their work in the field of fertilizers, both chemical and bacterial, and in the field of plant and animal breeding should prove of considerable interest to India. In another Chapter we have described the various fertilizers used in U.S.S.R. and the fertilizer practices. Very valuable work is being done in this field at the Institute of Fertilizers and the Institute of Soil Micro-Biology in Moscow. The other fields in which we should be able to learn a lot from the Russians are the fields of animal breeding and plant breeding. Dr. Naidu, who made a special study of animal husbandry is preparing a detailed report on the subject which will be submitted separately. We may, however, mention here some of the general points which emerged from our discussions with the various Scientists on problems of plant breeding and agricultural economics and statistics.

Lenin Institute of Plant Breeding.

3. The Lenin Institute of Plant Breeding at Leningrad which is headed by Academician Zukovski has done pioneer work in the field of plant breeding. This Institute has an annual budget of 13 million roubles and has as many as 14 experimental stations all over the country in the different climatic and soil zones of U.S.S.R., from the arctic in Northern Siberia to the sub-tropical in Georgia and Uzbekistan. While fundamental research in plant breeding is carried out at the main Institute in Leningrad, the experimental stations study different factors—geography, ecology, genetics, physiology, bio-chemistry, resistance to surroundings and different plant diseases. The Institute is also responsible for introducing new species and undertaking such special assignments in the field of plant breeding as may be referred to them by the Government. They publish a journal 'Bulletin of Applied Botany, Genetics and Plant Breeding' and special monographs *e.g.*, origin of cultivated plants, bio-chemistry of cultivated plants, vernalisation, selection of potatoes, Agriculture of Afghanistan, Agriculture of Turkey, etc. Academician Zukovski was very anxious to have direct contacts with Indian Scientists in the field and to arrange for the exchange of Indian scientific journals and monographs with their own publications. He himself is a specialist on wheat breeding and wanted to be put in touch with wheat experts in India. We had a general discussion with him regarding the development of different types of high yielding, frost resisting and disease resisting wheat. It seems that in U.S.S.R. very good work has been done on developing new types of wheat, maize and cotton which should be of considerable interest to us. In U.S.S.R. they follow the usual methods of selection and hybridisation for developing new varieties. At the same time they also follow a third method which they call acclimatisation which is based on the famous theory of Academician Lysenko.

Lysenko's Theory.

4. We could not meet Academician Lysenko but we had general discussions on his theory with Academician Zukovski and Dr. Yakovtznikov in Leningrad, Academician Constanin and Prof. Govin in Moscow and Academician Sadikov in Tashkent. It appears that in U.S.S.R. itself there is no unanimity regarding Lysenko's theory. Most of the Russian scientists believe that there is an element of truth in Lysenko's theory but it is not necessarily the whole truth. In the field of experiments they combine Lysenko's method with other methods and we got the impression that there was considerable scientific criticism going on in U.S.S.R. on even such theories of political significance as Lysenko's. On the other hand we felt that Lysenko was perhaps misrepresented in the West to a certain extent. Academician Zukovski told us that what Lysenko had said was not something new. These ideas have been previously propounded by various scientists

including Darwin himself. Russians do not reject the Mendelian theory completely. They say that for a number of proximate generations and under normal conditions Mendelian theory certainly holds good. But Mendelian theory cannot give a satisfactory explanation of the origin of species. What Lysenko has done is merely to bring Darwin's theory of species up-to-date and to show that under certain artificial conditions the inherited characteristics may be changed and even acquired qualities passed on to succeeding generations and the mutation of one species into another can be made possible. They pointed out that in wheat for instance certain inherited qualities tend to be persistent. But if the wheat seed is given certain special treatment—say kept in a very cold temperature 8 degrees centigrade below zero for sometime, these inherited qualities get shaken as it were and then if selection is tried it becomes easier to introduce the new qualities and develop new varieties. It is of course easier to change one variety into another but if the process is carried further it should not be impossible to change one species into another under certain artificial conditions. Most of the developments in the field of plant breeding in U.S.S.R. have been done either by orthodox methods of selection or by hybridisation. But there have been some developments also where acclimatisation combined with selection has given good results. Academician Zukovski's experiments have been mainly in the field of selection but he has tried acclimatisation also. Academician Constanin emphasised that any experiment for the development of new varieties should take account of the complex conditions of actual life not only when carrying out experiments in experimental stations but also in Research Laboratories.

Breeding New Varieties of wheat.

5. Wheat is the most important grain in U.S.S.R. The two main varieties are spring wheat which is cultivated all over and winter wheat which is cultivated in the Southern and Central Regions. Since the climatic and soil conditions vary very widely in U.S.S.R. from region to region, the wheat experts have found it necessary to study many varieties of wheat grown all over the World and evolve new varieties to suit different climatic and soil conditions. They have also studied some of the Indian varieties. The Indian varieties are not quite suitable for Russian conditions but they have found some of them useful for developing disease-free varieties. For instance, Academician Zukovski crossed the Indian variety of wheat—Triticum Sphaerococcum with the Russian varieties of (a) Triticum Timofeevi Zhuk and (b) Triticum Fungicidum Zhuk to develop disease-free varieties. Experiments are now in the 10th generation and the results so far seem encouraging. Academician Zukovski felt that these experiments take a longer time in the Russian climate and might take less time in the warm climate of India. The Russian scientists have obtained

quite encouraging results in developing rust resisting wheat by crossing varieties from Argentine and Canada with some of the Russian varieties. The Krasnodorka variety is a very good rust resisting wheat which they have devloped in U.S.S.R. For the dry regions of Central Asia they are trying to develop drought resisting wheat. They have developed two or three varieties *viz.*, 871, 69 and 289 which should be of considerable interest to India. The important thing about developing drought resisting wheat is to develop a strong root system. This is what they have been able to develop in the variety 871 which is a coarse spike type with very high degree of transpiration. This variety has been developed by following Lysenko's method of acclimatisation If good care is taken the yield of this wheat can be as much as 30 centners per hectare. This wheat is very suitable for areas like Uzbekistan and Ukraine. The variety 289 is another coarse spike variety which is very drought resisting and suitable for Middle-Asian Regions. Two hard varieties Milanopsk (69) and Durum (189) which they showed us would be in their opinion quite suitable for Indian conditions. It is a hard wheat and the yield can go upto 20 centners per hectare in a dry region. Although the yield of hard wheat is usually less than that of soft wheat, in the opinion of Russian Scientists they are not really less economic. Academician Zukovski suggested that our experts should carefully examine this point. Some other interesting varieties of wheat that we saw are Arandane (grown in Azerbaijan, yield 20 centners per hectare); Surkhent (drought resisting, dual purpose, grown in Tazikistan, yield 25 centners per hectare); Narodna (grown in Ukraine, rust free, yield 40 centners per hectare); Hulugu (disease resisting, grown in Georgia, yield 20 centners per hectare); Lutenzenze 758 (disease resistant, yield 35 centners per hectare); and Fergerum (disease resisting, grown in Kirgiz Republic, yield 25 centners per hectare).

Pushkin Experimental Station.

6. At the Experimental Station at Pushkin which is attached to the Lenin Plant Breeding Institute we saw some work regarding acclimatisation and vernalisation in progress in addition to ordinary selection and hybridisation. We were told that although vernalisation is a problem of physiology, geneticists have tried to use it for their own purpose. Experiments of Lysenko show that plants at the growing stage are susceptible to surrounding conditions. If we could change the surrounding we could change the nature of growth of plants by giving certain artificial stimulus at the gowing stage. Lysenko was able to change a winter variety of wheat into spring variety of wheat. At the Pushkin Experimental Station we saw experiments in which they were trying to do just the opposite *viz.*, to convert the spring variety of wheat into winter variety. There was a great need for doing this at present because Russia wanted to produce more winter wheat.

7. The method that they were following was roughly as follows:—They first subject the seeds of spring wheat to a temperature of 0° centigrade. Then they reduce the temperature to (—) 8 degrees centigrade where they complete the vernalisation period under artificial conditions. The seed thus treated is sown in spring. The seed obtained from this crop is sown a little earlier than usual next autumn. The seeds of the third generation are again sown a little earlier in the next autumn and so on. They claim that by this process they are able not only to develop winter wheat out of spring wheat but impart to it certain frost-resisting qualities. The experts of the Pushkin Experimental Station explained to us that the treatment, under very low temperature conditions, of the first sample of seed is necessary to shake, as it were, the hereditary qualities so as to make the seed more susceptible to other stimuli. Their experience was that whenever they wanted to improve the same quality of seed through a process of selection it expedited the result if the seeds were subjected to very low temperature for some time so as to make them susceptible to other stimuli. They first started work on frost-resisting wheat in 1946 and after four years in 1950 they were able to develop certain very good varieties by this process. We could not ourselves verify any of these claims and have merely recorded above what we were told.

Vernalisation not useful for India.

8. Academician Zukovski was, however, of the view that vernalisation by itself might not be of much interest to a country like India which has a short winter. Vernalisation is useful in a country where there is a long winter and it is necessary to shorten the growing period. He felt that it would be a sheer waste of time and energy for Indian Scientists to carry out experiments on vernalisation. On the other hand he felt that some of the techniques regarding acclimatisation, especially for pre-treatment of seeds which make the seeds more susceptible to new stimulus should be of interest to the Indian Scientists.

Perennial Wheat.

9. We asked him about perennial wheat developed in U.S.S.R. He said that Academician Tsitsin has developed this variety of so-called perennial wheat by crossing Triticum with Agro-priam as a result of 20 years' experiments. But the wheat that he has been able to develop is mainly useful as a fodder crop. Moreover, Academician Zukovski felt that it was not truly perennial because the life of the plant is not more than 3 to 4 years and there is a deterioration of the crop from the second year onwards. While perennial wheat is likely to be useful for zones like Siberia where supply of fodder is a real problem in the months of April and May, Academician Zukovski was very doubtful if such type of wheat would be of any use to India. He felt that the important thing for India should

be to develop high yielding, disease-free and drought resisting varieties and he thought that this could be done either by hybridisation or by acclimatisation and selection.

Maize.

10. Considerable work has also been done in U.S.S.R. on maize. Most of the improved varieties of maize are, however, hybrid varieties. The Russians are getting yields of as much as 100 centners per hectare. The techniques followed are almost the same as those followed in America or India. Some important varieties of Russian maize that we saw were Sorkaituli—Krugi (yield upto 100 centners per hectare), Krasnodorskaya (yield upto 80 centners per hectare), BUR 63 and 166 (yield upto 80 centners per hectare).

Cotton.

11. Russian scientists have also done considerable work in developing new varieties of cotton. Their own varieties were rather poor to start with, but now they have developed certain varieties of cotton especially Farghana (108) which is nearly as good as Egyptian variety and the yield is also fairly high. At present all the attention of the Russian Scientists is concentrated on developing a variety of cotton which should have a short and straight plant without too many branches and leaves so that the use of cotton picking machines may be facilitated. We saw in the Tashkent Cotton Institute and also in the Moscow Agricultural Exhibition some varieties of coloured cotton which the Russians have developed. These are of dull yellow or dirty green or dirty blue colour. The yield is slightly lower than that of the ordinary white cotton but neither Academician Zukovski nor Academician Sadikov with whom we had discussion on this subject laid much importance on the development of coloured cotton. They considered it as a curiosity rather than a really worth while development especially from the economic point of view. The colours are not at all good and there is considerable variation in the intensity of colour so that any manufacturer will have to take great care in mixing this cotton if he wanted to have uniform colour. In fact Academician Sadikov was somewhat surprised that there should be so much interest outside U.S.S.R. about the coloured cotton developed in U.S.S.R. He emphasized that Russian scientists were themselves more interested in developing better varieties of the usual white cotton. They felt that the colouring of cotton or cloth with chemical dyes is certainly a more economic and satisfactory way of getting coloured cloth rather than breeding coloured cotton.

Fruits & Vegetables

12. In U.S.S.R. they have evolved many new varieties of vegetables and fruits. Very intensive experiments for developing new types of apples, berries, grapes, etc. are being undertaken and U.S.S.R. has been able to develop some very good varieties. Here too the methods followed by them are the usual methods followed in other countries

Grafting of fruit trees in forests. and there is nothing special about it. One interesting thing which we were told, however, was that they have grafted on wild fruit trees in forests certain useful fruit plants and thus converted a whole forest into an orchard. The process is that they take a wild fruit tree in a forest, cut the top and graft a good fruit plant on it. Soon the grafted fruit plant gathers its nourishment from the root of the old tree on which it has been grafted and begins to grow vigorously and bear better and larger quantities of fruit than it had before. In Caucasus they have converted as much as 200,000 hectares of forest land into fruit gardens by this process. An important point is that the wild tree on which the new fruit plant is grafted should be of the same genus as the latter.

Hot Houses.

13. The various types of vegetables which are being developed at the Leningrad Institute are being multiplied at a hot house combine nearby. This hot house combine which is amongst the largest in U.S.S.R. is a very interesting institution. It has 60 hectares of garden land and 17 hot houses covering a total area of 25,000 square metres. They have plans to increase this area to 50,000 sq. metres by 1956. The hot house has about 190 workers of whom 70 work in the hot house itself. Its total income was 5 million roubles last year and expenses 4,900,000 roubles and the net profit was 100,000 roubles. Besides being used as Experimental Station by the Leningrad Plant Breeding Institute this hot house also sells its products in the Leningrad market. Such hot houses are very important in a country like U.S.S.R. where winter is very long and the only source of fresh vegetables is a hot house. The Leningrad Institute of Plant Breeding uses these hot houses and various Experimental Stations not only to carry out experiments in plant breeding but also for multiplying mother seeds of plants which they want to introduce in the country.

Seed multiplication.

14. The mother seeds evolved by the Research Institute are sent to the various Experimental Stations who multiply them. These are then sent to the State farms and certain collective farms which have special facilities for further multiplying them. The seeds multiplied at these farms are then collected by the Ministries of State Farms and Agriculture and distributed to all interested farms in the country. Some samples of the seeds are sent to the Leningrad Institute for checking and testing. The normal practice is to change completely the seeds of collective farms every four years although in special cases this may be done every five or six years also.

15. The various experiments which we saw in U.S.S.R. about plant breeding are certainly very interesting. But we feel that it is only in respect of wheat and cotton that we can profitably learn something from Russian scientists

We would recommend that we should invite a plant breeder like Prof. Zukovski or Prof. Genkel or Dr. Yakovtznikov to come to India and work for some time in collaboration with our experts in the I.A.R.I. Alternatively one or two of our top experts in plant breeding should be sent to U.S.S.R. to work either in the Academy of Agricultural Sciences or in the Lenin Institute of Plant Breeding. Dr. Fogorov and Prof. Sokolov of the Kamarov Institute of Botany, Leningrad and Dr. Sadikov of the Institute of Cotton, Tashkent were also particularly anxious to get in touch with their counterparts in India. Prof. Sokolov seemed very anxious to come with an expedition to India to collect plant specimens in this country.

Teaching of Agriculture.

16. Apart from research, considerable emphasis is given in U.S.S.R. on the training of agricultural and animal husbandry experts. The Timiriazev Academy of Agriculture in Moscow which we had the opportunity of visiting is the premier Institution in the country for the training of agricultural technicians. This Academy was established 89 years ago. Since its inception altogether 19,000 graduates have passed out of this Academy of whom as many as 17,000 passed out since the Revolution in 1917. At present there are altogether 4,000 students in this Academy and there are 37 buildings in the Campus apart from field stations and other establishments attached to it. The Academy has altogether 60 chairs on different subjects and over 500 lecturers. There are seven main Faculties in the Academy *e.g.*, (i) Agronomy, (ii) Agricultural Economics, (iii) Soils and Agricultural Chemistry, (iv) Horticulture, (v) Animal Husbandry, (vi) Agricultural Pedagogy for training teachers for Agricultural Schools, (vii) Refresher Course for Agricultural Officers. The regular course leading to the first degree of the Academy takes five years. The students who have passed their High School Examination are selected for admission to the Academy on the basis of an Entrance Examination. Those who get more than 60 per cent. marks in the Entrance Examination get stipend from the State which is about 300 roubles per month. All students are assured of employment by the State. Several months before graduation they are told by the Ministry of Agriculture as to where they are likely to be posted. In the matter of postings the personal preferences of the students are taken into consideration. The Academy has its own post-graduate course leading to the Degree of Candidatus (which is equivalent to our M.A.) after 3 years' study after graduation and Doctorate of Science after a minimum of two years' study after passing the Candidatus examination. Students for the Candidatus Degree get a stipend of 700 roubles per month and students for the Doctorate Degree get upto 3,000 roubles per month depending upon their previous salary.

Agricultural Economics.

17. In the Agricultural Economics Faculty alone of which we made a special study there are 42 teachers and 600 students. This Faculty produces every year about 100 Graduates, 25 Candidatus and 2 Doctors. The course on Agricultural Economics covers the following subjects:—

(i) Economics of Agriculture including Farm Management.

(ii) Statistics—
  (a) General.
  (b) Agricultural.

(iii) Organisation of the Economy of different Agricultural units *e.g.*, collective farm, Machine Tractor Station, State farm.

(iv) Law of collective farm lands.

(v) Book-keeping at various agricultural establishments.

(vi) World Agriculture.

(vii) Economic geography.

(viii) Planning in Agriculture.

18. The students who graduate in Agricultural Economics are generally employed as Directors or Deputy Directors of Machine Tractor Stations or State farms and by the Economic and Planning Organisations in the Ministry of State Farms and Ministry of Agriculture and also in the Planning Commission. The training that is given in Economics and Statistics at the Timiriazev Academy of Agriculture is naturally with special reference to agriculture. Training in general economics is given in all colleges and Universities. Similarly there are special provisions for giving training in general statistics. There are two Institutes of the Academy of Sciences which carry on research in Economics (including Economic Statistics) and in Mathematical Statistics.

Institute of Economics.

19. We had an occasion to visit the Institute of Economics in Moscow which is the top-most Institution for economic studies in the Soviet Union. The Institute of Economics was formerly a separate Institute but now it has been made a part of the Academy of Sciences because it was felt by the Russian authorities that there should not be any separation between Social Sciences and Natural Sciences. Social Sciences are influenced by developments in Natural Sciences and the application of Natural Sciences are conditioned by social factors. Hence, in U.S.S.R. it is felt that all the Sciences whether these are Natural Sciences or Social Sciences should be under the Academy of Sciences.

20. All important research works on economic problems in Soviet Russia are done at the Institute of Economics which has four main Departments and a number of Sections as follows:—

I. **Department of Soviet Economy**

Section 1.—General problems of socialist political economy.

Section 2.—Industrial problems.

Section 3.—Soviet Agriculture—collective Farms and Machine Tractor Stations.

Section 4.—General Problems of Soviet Agriculture.

Section 5.—Soviet Agriculture—State Farms.

Section 6.—Soviet Trade and Finance.

Section 7.—Statistics.

II. **Department of Capitalist Economics**

Section 1.—General problems of modern imperialism.

Section 2.—American countries.

Section 3.—Colonial countries.

Section 4.—Condition of working class movements in capitalist countries.

Section 5.—Statistical changes in capitalist countries.

III. **Department of Peoples' Democracy.**

IV. **Location of Industry and Agriculture in U.S.S.R.**

We were told that there was a proposal to start an independent Institute of Agricultural Economics next year under the Academy of Sciences for further research on agro-economic problems.

21. Some of the publications of the Institute of Economics that we saw are obviously propaganda literature. But there are also a few which are useful technical works. We found that Soviet economics has a more technical character than the economics with which we are familiar Recently, however, the Institute of Economics has brought out a book on economic principles which is supposed to be the latest authoritative exposition of Marxian Economics. In fact Stalin himself took a hand in the first drafting of this work. 3 million copies of this book were issued when we were in Moscow and people were so

anxious to get a copy that most of the book shops had sold out their stocks. The Institute of Economics brings out a monthly journal 'Questions of Economics' in which various problems of Soviet economics are discussed by experts. It will be useful if arrangements could be made to get some of the scientific journals and books published in Russia for our Central Research Institutes.

Extension Agencies.

22. In Soviet Russia there is a very close link between research and extension. As has been mentioned earlier the Ministries of Agriculture and State Farms have special departments for extension at the Union level, Republic level and Oblast level. The Machine Tractor Stations controlled by the Ministry of Agriculture and the Trusts under the Ministry of State Farms, with their large complement of technical staff, form the link between these departments and the farms. The problem of extension is relatively simple in U.S.S.R. because they have only 94,000 collective farms and 4,700 State farms to look after, compared to millions of small farms which we have in this country. Moreover, each of these farms employs a number of trained agronomists, engineers, zoo-technicians, etc. which enable them to make a good use of the extension services provided by the State, understand readily the implications of the improvements recommended by the extension agency and formulate properly their own problems which have to be passed on by the extension agency to the Research Institutes for solution.

Relation between Research and extension.

23. In U.S.S.R. a great emphasis is laid on the utilitarian aspect of research. Even the few institutes where fundamental research is carried on have to submit their research projects from time to time to committees of experts and convince them that at least in the long run, if not in the near future, social benefit is likely to follow from the work and that the progress is reasonably satisfactory. All the other 146 research institutes and 1,000 experimental stations concentrate on practical problems which are referred to them by the Government, by the collective farms and the State farms. After an improved method is developed by a research institute, it is tried out first in the experimental stations and then in demonstration plots in collective and State farms. The results are then placed before a committee of experts. If this Committee approves the method, the concerned extension agency sets about preparing extension literature and films about it and gets them translated into regional languages. Officers of the M.T.S. and Trusts then distribute these pamphlets etc. to collective and State farms and personally visit them to give talks and demonstrations.

Experiences of Collective Farms exchanged.

24. The reactions of the farmers and difficulties, if any, experienced by them are also collected and passed on by the extension agencies to the research institutes. The extension agencies also make arrangements for making

the experiences of outstanding collective and State farm workers available to other farmers. Sisterhood relations are established between different collective farms, improved seeds and techniques exchanged, experiences compared, and educational tours of promising farm workers arranged. In fact one of the extension officers told us that the average collective farmer seems to be more impressed when he is told that a brother farmer has tried out a new technique and found it useful rather than the recommendations of even well known research scientists. It appears that three or four years back in their zeal for stepping up agricultural production, some research institutes recommended certain new techniques without adequate field trial, the extension agencies propagated them without proper examination and the chairman of collective farms adopted them rather too readily with the result that some of the farms had very unfortunate experience. This has now made the collective farmer cautious and the research and extension organisations in U.S.S.R. more careful.

Agricultural Exhibition Keystone of Extention set-up.

25. Russians are now laying more stress than hitherto on demonstration, discussion and exchange of mutual experience by collective farmers and also trying to encourage a spirit of competition among them. The great agricultural exhibition which has been organised in Moscow since last year is the latest step taken in this direction. In fact this exhibition has become to-day the keystone of the Russian extension system. This is a place where the works of the best farms are demonstrated and the best farmers are honoured. There is a keen competition amongst farms all over the country for the honour of being selected for this exhibition and as in a football league there are annual promotions and relegations so that no one can rest on his laurels. *Pari passu* the results of latest research are also shown in this exhibition and talks by experts arranged. Batches of promising collective farmers are brought from all over the country at government expense every week in summer to see the achievements of the best farms in the country and get a closer acquaintance with the work of the research institutes. In winter when the exhibition is closed, the buildings are used for organising seminars and short courses for the young farmers of the land. Besides, the agricultural exhibition also helps to bring the farmers and other sections of the population, specially the factory workers, nearer one another and better appreciate each other's problems and keep in the forefront the ideals which the State seeks to achieve in the agricultural field.

CHAPTER XVI

THE AGRICULTURAL EXHIBITION IN U.S.S.R.

Agricultural Exhibition.

The Agricultural Exhibition in Moscow is one of the largest and most magnificent that we have ever seen and deserves detailed description especially in view of its role in agricultural extension work explained in the previous chapter. It has been organised on the same giant scale which is the characteristic of everything that is done in U.S.S.R. It covers an area of about 207 hectares of land in which there are 76 pavilions and 230 other sub-structures totalling to 2 million cubic metres of space. Besides the main pavilion which gives a picture of U.S.S.R. in a nutshell, there are separate pavilions for the 16 Union Republics, 12 pavilions representing different zones of the Russian Federation, the plant growing section which comprises pavilions devoted to the display of different crops; the livestock section which shows the experience of advanced breeders of cattle, horses, sheep, swine, poultry, rabits, as well as of hunting and the breeding of fur animals; the section of mechanization and electrification of agriculture including a model Machine Tractor Station; collective-farm buildings; and a recreation zone. All these pavilions feature the experience of 800 collective farms, 300 State farms, 200 M.T.Ss, livestock and meadow melioration stations, more than 300 livestock farms, many scientific research and experimental establishments, and scores of thousands of advanced agricultural workers, experts and organisers, the total number of exhibitors being 170,000.

2. A monumental sculptural group of a worker and a woman collective farmer, which had adorned the Soviet pavilion at the World Fair in Paris in 1937, towers over the square in front of the Exhibition. The Main Entrance is a high triumphal arch crowned with the emblem of the Exhibition—a sculptural composition of a tractor driver and a woman collective farmer holding aloft a golden sheaf of wheat. A broad avenue lined on both sides with 14 fountains leads to the Exhibition's Kolkhoz Square of which the central structure is the main pavilion and the 16 Republican pavilions and 12 zonal pavilians arranged around a big lawn decorated with two huge fountains.

The main Pavilion.

3. The main pavilion, a hundred-metre-high three-tier building, shows the entire history of agriculture in U.S.S.R. and the importance of industries of the country as the basis for the reconstruction and promotion of Soviet agriculture through a large number of attractive

paintings and sculptures, dioramas, diagrams, tables, drawings, photopanels, bas reliefs and high reliefs. The twin problem of the Soviet agriculture has been to win over the small farmer to a system of collective farming and to eliminate friction between the agricultural worker and the industrial worker. The entire emphasis of the Exhibition is, therefore, to prove how collective farming has been a vast improvement over small scale peasant farming; how improvement of agriculture is only possible through the efforts made by the industrial worker in producing larger and larger numbers of agricultural machinery, etc., and through the work of the scientists in the various fields.

4. A two-faced diorama portrays a pre-revolution Russian village and a socialist collective farm village of today which brings out in a dramatic manner the striking contrast between life in the two. Besides, the diorama is a concrete example—the Budyonny Kolkhoz in the Odessa Region which has 3,430 hectares of land for perpetual use. The picture shows how prior to collectivisation the crop here never exceeded 5 to 6 centners of grain per hectare while in 1952-53 it was as much as 23·5 centners of grain per hectare. Compared with pre-war period, the collective farm's income has increased 12 times. Every able-bodied collective farmer put in 403 labour day units last year, receiving for each unit 8 roubles 30 copecks and 3 kilogrammes of grain, not counting vegetables, fruit, honey, butter and fodder for the livestock owned individually by the collective farmer. Two halls of the main pavilion are devoted to displaying how Soviet agriculture has improved through progressive mechanisation and electrification and what part the Soviet industrial worker played in it. At the beginning of 1953-54, the Machine Tractor Stations had more than one million tractors (in terms of 15 H.P. Units), 270,000 grain combines and many other machines and implements. In the period 1954—57 it is planned that agriculture would receive not less than 500,000 general purpose tractors and 250,000 row-crop tractors, not counting numerous other agricultural machines and implements. The launching of the large power stations on the Volga and the Dnieper, the Kama and the Ob, the Angara and the Irtysh, would permit the further expansion of the mechanisation and electrification of Soviet agriculture and of the area under irrigation. The main pavilion also contains numerous exhibits emphasizing the role of the country's scientific research and experimental stations in improving Soviet agriculture and emphasises the flourishing culture and life of the Soviet collective farm village.

Other Pavilions.

5. What the main pavilion seeks to do for the Soviet agriculture as a whole, each of the 16 Republic pavilions and 12 zonal pavilions seeks to do for the respective zone. Each of these pavilions gives an idea of the main agricul-

tural and animal husbandry products of the particular Republic or zone as also an idea of the achievements of Soviet agriculture during the last three decades. These pavilions are also used for honouring the best collective farms and the best collective farm workers and the agricultural scientists of these Republics or zones. Special stalls have been given to the best collective farms, and photographs of the best collective farmers together with statements regarding their achievements have been displayed all over these pavilions. The idea is as has been explained earlier, to use these pavilions as an instrument for fostering competition amongst the collective farms and agricultural workers. Every year an assessment would be made of the work of various farms and various farmers and the best ones would be given the honour of being displayed in these pavilions. Those who would fail to keep up with the others would be relegated. In fact this emphasis on the performance of individual farms and workers and bestowing honours on them and displaying their photographs in public places appears to be an essential part of the Soviet incentive system. Nowhere in the World perhaps the individual worker is given so much publicity as in this collectivist State. As we found portraits and statues of Lenin, Stalin and other national leaders all over the country, similarly we also found in every farm boards displaying photographs of the best workers of the farm, and in every section a display of the photographs of the best workers of the section.

Key stone of Agricultural extension.

6. Each of the Republic pavilions is built in the traditional national style designed by local architects. For instance, the pavilion of the Byelo Russian Republic has a double colonnade covered with flowery majolica in the Byelo Russian national design, a light arcade with graceful columns leads to the pavilion of the Georgian Republic; a rotunda resting on columns with national paintings and crowned with a latticed cupola leads the visitors to the pavilion of the Uzbek Republic; skilful carving on stone and wood, depicting the element of national art, marks out the pavilion of the Tajik Republic. The pavilion of the Russian Soviet Federal Socialist Republic displays proudly the claim that the World record of harvest of grain crop is held by this Republic. Yields of 50 to 70 centners of spring wheat per hectare have been obtained by collective farmers in Siberia and in the Volga country. Great success has been scored by M.T.S. workers in the Russian Federation. They have mechanised 95 per cent. and 86 per cent. of the sowing and harvesting processes respectively. The average milk yield per cow in many collective and State farms is more than 5,000 kilogrammes. There are many farms where yield of wool is more than 7 kilogrammes per sheep. The Kemerov Region in Siberia is stated to be the home of the World's biggest potato harvest. A. K. Yutkina, a woman collective farmer at the Krasny

Perekop Kolkhoz is stated to have grown as much as 1,331 centners of potatoes per hectare. The pavilion of the Ukrainian Republic has exhibits from the Bolshevik Kolkhoz Sunny Regions where during the past three years the harvest of wheat has been 18 to 25 centners and of maize 50 centners per hectare. The milk yield has been 5,000 to 6,000 kilogrammes per cow. It is stated that the income of this collective farm was more than 5 million roubles last year, the money wage per work day alone being 10 roubles. The pavilion displays prominently a picture of Ozerny who raised record crops of maize. The pavilion of the Kazak Republic shows the tremendous work that has been done to transform nature in this once very backward region. It is stated that in 1953-54 the area of irrigated land in Kazakhistan exceeded 2 million hectares. At one time this hungry steppe land was a barren desert, but it is claimed that now with the building up of the Kirov irrigation canal, it has been transformed into a flourishing cotton growing district. Ch. Bersiyev of the Kurman Kolkhoz of Kazakhistan is said to have secured the World record when he grew 201 centners of millet per hectare. Ibrai Zhakhayev of Kzyl—Tu Kolkhoz is said to have set up a record for rice growing raising a harvest of 162 centners per hectare and O.K. Gonazhenko of the May Day Kolkhoz is claimed to have gathered the World's largest crop of sugar-beet *viz.* more than 1,500 centners per hectare. It is said that Kazakhistan has already reclaimed 5 million hectares in the first half of the current year. The Azerbaijan Republic shows in its pavilion the Pravda Kolkhoz which gathered rich harvests of tea leaves—from 2,000 to 5,000 kilogrammes per hectare. At this collective farm, it is stated, the wage per work day unit is 11 roubles 75 copecks and 3·2 kilogrammes of grain. M. Z. Sadikova who was awarded two orders of Lenin in 1949 and 1950 for high tea harvests was honoured with a title of Heroin of Socialist Labour during the current year for a harvest of 43·8 centners of Trebizond tobacco per hectare. The pavilion of the Kirgiz Republic shows the experience of Alya Anarov of the Molotov Kolkhoz who in recent years gathered an average harvest of 80 centners of cotton per hectare. The pavilions of the Turkman and Tajik Republics, which were very backward regions three decades back, also claim very high yields which enabled collective farms to pay a wage of as much as 28 roubles and 4½ kilogrammes of grain per labour day unit to their workers. The pavilion of the Uzbek Republic displays the activity of Nazar Ali Niyazov of the Voroshilov Kolkhoz who, it is said, worked out and introduced, new highly productive methods of production of cotton. Among the exhibitors here are the Moscow Kolkhoz and the Sverdlov Kolkhoz which, it is claimed, have raised as much as 36 to 39 centners of cotton per hectare. The Republic is noted for its grapes and apples and it is claimed that the Sovkhoz No. 1 in Tashkent Region has been able to obtain a grape harvest of as much as 234 centners per hectare and the Shroder Fruit and Berry Institute has grown in its orchards as much as 850 centners of apples per hectare. Uzbekistan which was a very backward region before the Revolution and had only 2 per cent. literacy and very small production of cotton, today claims to have 100 per cent. literacy with 5,198 schools and 1,279,000 pupils, 2,414 Kolkhozes with a total area of 12,071,000 hectares, besides 103 Sovkhozes and 253 Machine Tractor Stations. Mechanisation in cotton growing is today as much as 98 per cent. for ploughing, 98 per cent. for sowing and 76 per cent. for cultivation. Even harvesting is being rapidly mechanised, Uzbekistan having as many as 12,266 mechanical cotton pickers in operation in 1953. Total area under cotton in Uzbekistan is said to be 1,342,000 hectares with total production being 2,995,000 tons, in 1954. 88 per cent. of Kolkhozes in Uzbekistan are said to have more than 1 million roubles of income per annum each.

Subject-wise Pavilions.

7. If the Republic and the zonal pavilions have been designed to display the achievements of farms and farmers in these various regions, the subject-wise pavilions *viz.*, pavilions of plant growing, livestock breeding, mechanisation, electrification, etc. are designed not only to display the achievements in these fields but also to educate the general public and the practical farmers who visit these pavilions in the latest scientific techniques in the respective fields. For instance, the pavilion on farming displayed the Soviet system of improving the quality of seeds—how in U.S.S.R. seeds are cultivated in accordance with the State Plan—how there is a net-work of Scientific Research Institutes, State Selection and Experimental Stations and fields that work to improve local and established varieties as well as to propagate new ones. The pavilions on grains, cotton, flax, hemp and other fibres, sugar-beet. oilseeds and other industrial crops, potatoes and other vegetables, and vine creepers and fruit crops display best techniques of growing these crops. The pavilion of water economy demonstrates the principal stages in the development of irrigation and drainage in U.S.S.R. since the Revolution and displays models of the Hydro-technical construction on the Volga, the Don and the Dnieper. The pavilion of floriculture demonstrates the large scale afforestation work being done in the country and the pavilions of apiculture and sericulture display achievements in the respective fields. The pavilion of livestock breeding and its many affiliated pavilions on beef and dairy cattle, horse, sheep, poultry, rabbit, fish, hunting, trapping and fur farming demonstrate the achievements of animal husbandry in U.S.S.R. The pavilion of livestock breeding is devoted to the raising of the productivity of dairy cattle in the country's State farms. More than 500 State farms, it is claimed, get over 3,500 kilo-

grammes of milk per cow. The Cinemascope in the pavilion shows the work of K. T. Losochenova, a dairy-maid of Stalin Kolkhoz in the Moscow Region who claims to have got as much as 6,500 kilogrammes of milk per cow. In the hall devoted to sheep breeding the work of S. Z. Germashev and V. M. Boshko, shepherds of the Land of Soviets Collective Farm in the Stavropol territory is displayed. It is said that from each sheep they got as much as 7 kilogrammes of fleece and from every 100 ewes they reared as many as 145 lambs. Four pavilions of beef and dairy cattle display more than 300 heads of cattle of 40 main breeds. There are quite a few cows in this pavilion which, we were told, gave more than 10,000 kilogrammes of milk annually, the highest figure being 13,572 kilogrammes of milk given by a cow Komsa of the Kostroma breed from the Karavayevo State Farm. The sheep pavilion demonstrates about 370 sheep of 50 breeds and displays rams which yield 18 to 23 kilogrammes of wool each year. In Voliers built in a semi-circle behind the pavilion of hunting, trapping and fur farming, are kept live exhibits—silver black foxes, polar foxes, sable, mink and hybrids of these foxes, reindeers, beevers, muscrats and squirrels. Opposite the squirrel volier a large cage houses a hunting golden eagle which is used in hunting foxes, hares and wolves in the Kirgiz and Kazak Republics.

Mechanisation Pavilion.

8. Mechanisation and electrification of Soviet agriculture is specially emphasised in the mechanisation pavilion and at the Model Machine Tractor. Station. The building contains 26 halls having a total capacity of 318,000 cubic metres. More than 1,000 implements and machinery are on display here. The standard Soviet tractors *e.g.*, S-80, DT-54, KD-34 and KDP-35 are on display. These tractors use the usual liquid fluid—kerosene or petroleum or diesel oil. An interesting type of tractor is the charcoal burning tractor which operates both on logs and peat bricks in special regions, rich in wood or peat and also the electric tractor which makes use of cheap hydro-electric power. There are also interesting types of bull-dozers, jungle clearing, tree cutting and excavating equipments and heavy reclamation tractors on display which are being used in U.S.S.R. for land reclamation work. Various pumps and equipments used for not only flow and lift irrigation but also for sprinkler irrigation are also at display. One small but very interesting exhibit was a simple type kerosene lamp a type of electric power generator suitable for rural radio sets.

9. Various tractor-drawn implements e.*g*., seeders, cultivators, harvesting machines, etc. are also displayed in the pavilion. The SSh-6 tractor seeder is used for sowing corn on the square-pocket method, the KU-2 combine does the harvesting. It is claimed that the latter increases labour productivity 35 times as compared with manual harvesting. One interesting machine is SRN-4

which plants on the square-pocket method vegetable seedings grown in peat-compost pots. It lays furrows, waters the cultivated area, plants the seedlings, covers the latter with soil and while levelling sprinkles the area with loose earth. Another interesting exhibit is the SKG-4 four row square pocket potato planting machine, which plants potato tubers in the furrows in pockets—two or three tubers in each pocket—at a strictly defined distance between pockets and between the rows and while planting potatoes on the square-pocket method injects fertilisers into the pockets. A number of other interesting exhibits are shown, which aim at mechanising the harvesting of crops like potatoes, vegetables and cotton which are more labour consuming processes. The KKR-2 potato harvesting combine, operating as a caterpiller tractor trailer, covers 4-5 hectares a day. There is a single row cabbage harvesting machine which has mechanised the harvesting of cabbages to such an extent that it cuts down the demand for man-power by 4 to 5 times. Special combines for the harvesting of sugar-beet and cotton are also on display. Two halls demonstrate the practical electrification of agriculture. They also display various machines and mechanisms used for draining marshes and bogs, loosening soil, clearing land from stumps and roots scrapers for transplanting soil, filling pits and ditches. A special hall is devoted to the use of aviation in agriculture both for spraying seeds and fertilizers and for spraying insecticides.

Model M. T. S.

10. A model Machine Tractor Station occupying an area of 10 hectares adjoins the pavilion of mechanisation and electrification. The M.T.S. Estate demonstrates the most rational lay-out of the various M.T.S. buildings and the work methods of the best stations. The Estate also displays a model Tractor Brigade field camp. Adjacent to the model MTS there is a section exhibiting the building of a collective farm village including a large two-storeyed Kolkhoz House of Culture built of stone, a model village Soviet and collective farm office, a shop of the rural consumers' society and a village tea house. Nearby half hidden in dense foliage stands a collective farm Kindergarten and close by is a collective farm nursery school. Opposite the school are the rural post and telegraph office and a savings bank.

Assessment.

11. The exhibition is, undoubtedly, quite an impressive affair, but our visits to the country-side showed that it would be wrong to consider it as representative of agriculture as it stands today. We found that the standard of the average collective farm or M.T.S. in U.S.S.R. is much lower than what is displayed in the Exhibition. The Exhibition represents, in short, the ideal rather than the average. In fact it is a part of the general attempt of the Soviet authorities to raise the level of production and efficiency of the average collective farmer to the high

technical level which is displayed in the Exhibition. It would be as wrong to say that the Agricultural Exhibition represents U.S.S.R. agriculture as to say that U.S.S.R. agriculture is hopelessly backward and has no relation to what is displayed in the Exhibition. U.S.S.R. like India is a country of hills and valleys not only literally but also metaphorically, in regard to achievements in various fields—scientific, industrial as well as agricultural. There are a few collective farms and Machine Tractor Stations in U.S.S.R. which have reached a very high pitch of efficiency. But there are also hundreds which are very much below standard. If the latter represents the bulk of the reality as it stands today, one should not forget that the former also gives an idea of what height agriculture in U.S.S.R. is capable of attaining provided there is the best possible use of modern scientific achievements.

Emphasis on bigness

12. One general impression that we got from this Exhibition and this was confirmed by our experience elsewhere, is that in U.S.S.R. there is a curious emphasis on bigness. The bigger the machine, the bigger the farm, the bigger the building, the bigger the dam, the more happy an average Russian feels. In this perhaps he is not very much unlike the average American. In this quest for record-breaking achievements, it appears that the Russian often tends to lose somewhat the sense of proportion. The balanced development that one sees in a country like Switzerland and Japan of both the big and the small, of both the powerful machinery and the precision tool is strangely lacking in U.S.S.R. In U.S.S.R. practically nothing seems to have been done for the improvement of the development of the small scale industry or of the small farm. In the entire Exhibition we did not find a single word about the small farm and the tools and implements required by it. When we asked the various people in the Exhibition and also experts elsewhere about improved types of small implements used in the farm or wanted to see a small farm, they all categorically stated that the small farm did not exist in U.S.S.R. any longer and hence they were not doing anything to develop machines suitable for the small farms. This sounded somewhat strange to us because we knew that even in 1950 there were about 2½ to 3 million small farms in U.S.S.R. and when we flew over Central Asia we could see from the air small farms scattered amongst hills. No doubt the emphasis in recent years has been for increasing the size of the collective farm and eliminating the small farms completely. Hence wherever one may go in U.S.S.R. one hears how uneconomic the small farm was, how good it is that small farms have been eliminated, how even medium size collective farms of 500 to 2,000 hectares are not good enough, how it is necessary to combine five or six medium-size collective farms and form one gigantic collective farm, how small machineries are not good enough and have to

be substituted by bigger and bigger machines. Wherever we put a question to the Chairman of a collective farm as to what his most important achievement was, he would not say that it was careful husbandry or increasing the area under crops or even increasing the yield of crop per hectare, he would immediately say he had mechanised a large proportion of the various agricultural processes and that he was using so many large tractors. and combines, mechanical harvesters and sowing machines in his farm.

13. Most of the machines that we saw in the Exhibition did not appear to be of much use to a country like India where land is scarce compared to the population and for a long time to come the size of the average farm has got to be small. But there were a few reclamation and irrigation equipments which seemed to be worth giving a trial for possible use by our State Governments and State-sponsored organisations. Some of the forestry equipment that we saw may be also of some use to our Forest Departments especially in the Coniferous forests up in the Himalayas. The village radio equipment especially the cheap kerosene lamp power generator also appeared to be an interesting item. Some details of the equipments which we saw in the Exhibition and which we feel are likely to be of some interest to India and are worth giving a trial under Indian conditions are given in Appendix V.

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CHAPTER XVII

POLAND

It was at 9 A.M. on the 5th October that we left Moscow for Warsaw. The day was cloudy and the weather was also rather bad. We had, however, a fairly smooth journey although we could not see anything of the countryside until we reached Minsk. After Minsk the weather cleared and it was shortly after lunch time that we crossed the Russian border. From the sharp change in the landscape below it was not at all difficult for us to realise that we had left the land of collective farms behind us and returned to a land of traditional agriculture. The Polish countryside looked like that of any other West European country with small farms and scattered houses. We reached Warsaw at about 2 P.M. Warsaw time. The Mayor of Warsaw and the Deputy Minister for Foreign Trade of the Polish Government were at the aerodrome to receive us.

Warsaw.

2. We were put up at Hotel Orbis, a good hotel, which was more like a West European Hotel rather than a Russian one. In the afternoon we went out sight-seeing and in the evening were taken to a Polish Opera. Warsaw was almost completely destroyed during the War, first by the German attack, then by the rebellion of the Polish patriots and finally by the Russian counter offensive. At the end of the War the city contained nothing but huge mounds of rubble. We were shown 'ghettoes' where the Germans had killed hundreds of thousands of people. Even 10 years after the end of hostilities one-third of Warsaw was still in ruins. But the Polish people were making a heroic attempt to rebuild their capital city. A most inspiring instance was the way they had rebuilt the old city Square taking care that every piece of architecture was rebuilt exactly as the original was. Although the Government was Communist, they had rebuilt the Cathedral and were rebuilding the Royal Palace. All this work of restoration on the old site itself no doubt cost more time and effort than would have been required to build a new city elsewhere but like the rebuilding of Stalingrad, the rebuilding of Warsaw was considered important from the point of view of national morale. Apart from the restoration of the old historical buildings, the Polish authorities are constructing a large number of apartment houses, offices, factories, etc. The architecture of these new buildings seemed to us to be superior to the

architecture of the new buildings that we saw in Stalingrad. We felt that after Warsaw is completely rebuilt it would be a much better city than it was before the War.

Motoimport.

3. On the 6th October we met the Minister for Trade and also the Minister for Foreign Affairs. Both of them seemed to be very friendly towards India and anxious to promote trade and cultural relations between India and Poland. We were then taken to the office of the MOTOIMPORT which is the Polish trade organisation for the export of machinery. We found that Poland is manufacturing several types of agricultural machinery and one model of tractor. All these were much smaller than Russian models and were more suited to relatively smaller farms. A list of the agricultural machinery that we saw at the office of the MOTOIMPORT is given at Appendix VI(a). These are mostly horse-drawn implements. A Polish horse is a very hefty animal and has the strength of two bullocks. It may be, therefore, possible to use some of the Polish agricultural implements with a pair of bullocks provided certain structural changes are made. Our general impression, however, was that none of them was so very novel or different from the types which are already used in our mechanised farms. It is not also necessary to import these implements from Poland because it should be possible to fabricate them in India, if after trial any of them is found suitable for our requirements. The tractor that we saw was called "Ursus" C-45 which was more or less a copy of the German "Lanz" tractor. Particulars of this tractor may be seen at Appendix VI(b). The "Ursus" seemed to be quite a useful tractor but not better than the various tractors which are at present being used in India. We were also shown round the factory where the "Ursus" tractor was manufactured. The factory did not give an impression of efficiency. It appeared to be built mostly with machinery obtained from Germany by way of war reparations. The Polish authorities were, however, conscious of this fact and they told us that new factory buildings were being planned and they hoped to have a first class tractor factory soon. The Ursus tractor is a 45 H.P. wheel tractor but the Poles have proposals to build crawler type tractors also. We were also shown a factory for manufacturing machine tools. This factory appeared to be much better laid out and managed than the tractor factory. But all the machine tools that the Poles are manufacturing are required for their own use and they have practically nothing for export. Most of the machines in the factory are made either in Czechoslovakia or Germany. We noticed one curious thing about these Polish factories *viz.*, that they were much more heavily guarded than Russian factories. Moreover all the sentries were female soldiers. It appeared that in Poland there was even a greater shortage of male workers than in U.S.S.R.

Cracow.

4. On the 6th night we left Warsaw by train for Cracow. The Polish trains are smaller than the Russian trains and are exactly like other West European trains. We reached Cracow early in the morning of the 7th. Cracow was the old Capital of Poland and luckily escaped the ravages of the last War. It is a beautiful city of the medieval type and contains some of the best specimens of East European architecture. The University of Cracow is one of the oldest in Europe and is proud to count Copernicus as one of its alumnii. The market place of Cracow still retains a medieval appearance and is surrounded by a number of very fine buildings including an imposing cathedral built 5 or 6 centuries ago. The people of Cracow seemed to be very devout Catholics. There are statues or portraits of Madonna or of Christ at almost every street corner and unlike U.S.S.R. or Czechoslovakia these are still more numerous than the statues and portraits of Lenin and Stalin. In Cracow we visited the Agricultural College, the University and the Old Royal Palace, the new steel plant which the Russians are building for Poland at Nowa Huta and the famous salt mine. The steel plant which the Russians are building in Nowa Huta for the Polish Government was started in 1950 and has been now about three-fourths finished. A part of it is already in production. It seemed to be quite an efficient piece of engineering work Its capacity is 1½ million tons every year. The manager and the senior technical officers are, however, all Russians. The salt mine of Cracow is famous for its underground Cathedral where there are very beautiful sculptures carved out of rock salt. Like the caves of Ellora this underground church in the salt mine with its beautiful panels of biblical stories is one of the most remarkable things that we have ever seen. On the 8th morning we went to see a fertilizer plant at Tarnow. This plant manufactures about 180 tons of ammonium nitrate every day besides nitric acid and certain other chemicals. This factory which was originally built about 25 years ago was almost entirely damaged during the War. It has been rebuilt since 1945. Most of the technical men continued from the pre-war days but the Manager is a non-technical man nominated by the Communist Party. We found in this as well as in the other Polish factories that we visited, a strange contrast with Russian factories. In Russian factories the technical officers seemed to be quite self-confident and occupied positions of authority but in Poland they seemed to be very diffident and would not give reply even to such simple questions as how much wage a labourer got without checking it up first with the Manager who was a nominee of the Communist party. While the Russian technicians seemed to be trusted people, most of the Polish technicians appeared to be people who were only on sufferance and were working under some sort of restraint.

5. We returned to Warsaw on the 9th morning and had long discussions with the Minister for Planning, De-

Planning in Poland.

puty Minister for Agriculture and Deputy Minister for State Farms. The procedure for planning in Poland is more or less like that in U.S.S.R. The planning set-up is almost the same but the main difference is that, unlike in U.S.S.R., in Poland there is a fairly large private sector and planning for this private sector has to be indirect rather than direct. Price policy and the provision of incentives, therefore, play a much more important role in Poland than in U.S.S.R.

6. This is especially true of agriculture. In Poland all the lands belonging to the old German and Polish landlords have been confiscated by the State. Most of the big farms have been converted into State farms and are being run by the Ministry of State Farms more or less on the U.S.S.R. model. The main difference is that State farms in Poland are much smaller *i.e.*, 250 to 1,000 hectares compared to 20,000 to 40,000 hectares in U.S.S.R. All other land has been distributed to the farmers. Some of the small farms have no doubt been consolidated into co-operative societies of 100 to 500 hectares each but a large majority of the farmers in Poland are peasant proprietors. Out of a total of 20 million hectares of arable land about 3 million are under State farms, 1½ million are under co-operative farms and the remaining 15½ million hectares are being still cultivated by individual farmers.

State Farms.

7. There are altogether 7,500 State farms in Poland. About 10 State farms are controlled by a Trust which has a separate budget of its own. At each Trust Headquarters there is a highly skilled technical staff comprising of about 4 engineers, 2 agronomists, 2 to 4 zoo-technicians. Besides this, in each State farm there is one agronomist, one zoo-technician and a number of mechanics and skilled workers. Unlike in U.S.S.R. the main unit of management is not the State farm but the Trust. All machines belong to the Trust and are distributed by it amongst the various constituent State farms according to requirement. The State farms are highly mechanised although the machines and tractors used are much smaller than those used in U.S.S.R. Wages of State farm workers are fixed on the same basis of norms and premia and discounts as in U.S.S.R. Each State farm worker is given a personal allotment of ½ to 1 hectare of land.

Co-operative Farms.

8. There are altogether 10,000 co-operative farms in Poland, each having on the average 30 to 40 families. The area varies from 40 hectares to 1,000 hectares. The co-operative farms in Poland are of 4 main types:—

TYPE I—The peasants remain private producers, land remains separate, peasants combine their efforts in ploughing, sowing and harvesting only. These are like our better farming societies.

TYPE II—The peasants pool their land, they retain their implements and working animals, the proceeds are distributed according to work done, each member has a share according to the land put in the co-operative and gets hire charge for implements and working animals lent to the co-operative.

TYPE III—It is similar to type II but in this case implements and working animals also belong to the co-operative and the distribution of proceeds is according to input of labour and the share of land only.

TYPE IV—Here distribution of proceeds is according to input of labour only. This is more or less like collective farms of U.S.S.R.

9. In Poland joining a co-operative farm is entirely voluntary. A peasant has the right to withdraw from the co-operative farm and in such a case his piece of land or an equivalent piece is returned but the Polish Government is trying to make co-operative farming as attractive as possible by giving various types of special inducement for it *viz.*, credit, machinery, equipment, fertilizers, assistance of Machine Tractor Stations, etc., at concessional terms which are not available to the ordinary peasant.

Machine Tractor Stations

10. The functions of the Machine Tractor Stations in Poland are more or less like their counterparts in U.S.S.R., but they are somewhat smaller. Each Machine Tractor Station in Poland has between 30 and 100 tractors and a few combines and a total personnel of 150 members including agronomists, zoo-technicians, mechanics, etc. They charge the co-operative farms about 60 zloties and 40 kilogrammes of rye for ploughing one hectare of grain land and 80 zloties per hectare for digging potatoes. They also act as the channel between the State and the Co-operative farms for all aid like fertilizers, credit, etc., which the State provides to the Co-operatives. There are altogether 400 such Machine Tractor Stations—approximately one per district—for the 10,000 Co-operative farms which are there today in Poland.

Commune Machine Stations.

11. Besides these Machine Tractor Stations there is a Commune Machine Station in each Commune or group of villages in the country. These stations have been established to serve the individual farmer. They generally have horse drawn machines and implements although a few have one or two tractors also. The Commune Machine Stations do not maintain any horses. Horses are provided by individual peasants. In case of need these stations lend their machines to the farmers to be used with their own horses. These stations also look after agricultural extension service in their respective areas. Each station has usually one representative in each village of

the Commune and about 20 zoo-technicians, agronomists and machanics at Headquarters. We were told that in Poland small and middle size individual peasants provide about 70% of the total output and 17% of the marketable surplus while the State farms and Co-operative farms together provide 13·4% of the total output of grains but as much as 27% of marketable surplus. In terms of yield also, we were told, co-operative farming has shown encouraging results. While the average yield of peasant farms has gone up from 12·2 quintals per hectare in 1950 to 12·6 quintals per hectare in 1952, that of co-operative farms has gone up from 14·5 quintals per hectare in 1950 to 15·1 quintals per hectare in 1952. The Polish Government is, therefore, encouraging co-operative farming as much as possible. Their ultimate objective may be to follow the example of U.S.S.R. and to pass on from N.E.P. to co-operative farming and then to collective farming at an opportune moment. But so far the Polish authorities have been very careful in their handling of the individual peasant. We were assured that there was no attempt to force the pace or to compel the Polish farmer to join a co-operative farm. All that they are trying to do is to regulate the Polish peasant indirectly and influence him with all sorts of inducement to join co-operative farming. There is no idea at least for the present of expropriating the peasant.

The Individual Farmer.

Price policy, provision of consumer goods as well as producers' goods like fertilizers and of technical services and contracts for purchase of the produce are the various means through which the Polish Government is trying to make the Polish farmer to follow the planned pattern. Although there is individual planning for State and co-operative farms as in U.S.S.R., there is no such planning for the peasant proprietors. Planning for such farmers is usually done on a district basis by district planning offices in consultation with the representatives of farmers. The plan for a district is announced sufficiently early before the sowing period and indications given as to how much of what crop is to be produced and so on. Simultaneously the Government purchase price as also the quantity to be purchased by Government are also announced. Then the Government enters into a contract through the commune or village co-operative societies with each farmer as to how much he should sell to the Government. This contract is a major means by which a farmer is made to follow the plan. Supplies of fertilizers, credit, etc. are also given to the farmer according to this contract.

12. In Poland there is today a great emphasis on the use of fertilizers. A number of new fertilizer factories are under construction and according to the present Six Year Plan, the output of chemical fertilizers is to be trebled. Besides this, Poland has a large scheme for electrification of rural areas and also for land reclamation. More than 3½ million hectares of fallow land have been reclaimed

since the War. The progress of Polish agriculture has been quite encouraging as will be seen from the following figures supplied to us by the Polish authorities:—

Progress of Polish Agriculture.

	1937	1946	1949	1953	1954
Total output . .	100	67	127	133	139
Production of plants	100	71	131	126	134
Animals . . .	100	63	121	142	145

Compared to the progress of industries, however, the record of agriculture is not so good. While during the first five years of the Six Year Plan for Poland the over-all increase of industrial production has been 142%, that for agricultural production has been only 82%. Nevertheless Poland is today one of Europe's leading producers and exporters of beet-sugar. The 1953 output of sugar was 1·1 million tons. Other agricultural products exported by Poland are seed potatoes, fresh vegetables, fruits, cured meat, eggs, vegetable preserves, poultry, fish and medicinal herbs.

13. Polish agriculture with its basis of peasant farming seemed nearer to Indian conditions than Russian agriculture and we may have some useful lessons from the Polish system of Machine Tractor Stations for co-operative farm and Commune Machine Stations for individual farms and above all from the experience of Polish land reforms.

Land Reforms is Poland.

14. Apart from such big farms as have been converted into State farms all agricultural lands were distributed to the peasants soon after the present regime came to power. A ceiling of 50 hectares was imposed on individual holdings. Rent was reduced and all old debts were liquidated. The immediate result was, however, not an increase but a decrease in the marketable surplus. The small farmer had less surplus to sell and the reduction of the burden of rent and debts also relieved him of the necessity to sell even that surplus which he was obliged to sell before. Moreover, partly as a result of the post-war dislocation and partly due to the emphasis put by the new Communist regime on the production of capital goods the farmer could not get the consumer goods that he wanted in exchange for his produce and had less inducement to sell and even to produce. Soon the position became desperate and the Government was obliged to reverse its investment policy and increase the supply of consumer goods to the farmer and provide greater "material interestedness" by way of higher prices. They also had to make a wider use of the system of contracts and provide all sorts of special

inducements *e.g.* credit fertilizers, etc. for such peasants as entered into contracts for selling agricultural produce.

15. On the whole we were impressed with the great efforts that are being made by the Polish Government and the Polish people for the reconstruction and development of their country. The new system has its disadvantages as well as advantages. But the progress made so far is such as would do credit to any country. There is also no doubt that the Polish peasant is today much better off than he was before the War.

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CHAPTER XVIII

CZECHOSLOVAKIA

We left Warsaw for Prague shortly after noon on the 10th October. It was a beautiful day. As we proceeded towards Czechoslovakia, not only did the landscape look more varied and beautiful with hills and valleys which were a great contrast to the plains of U.S.S.R. but the country-side also looked much more prosperous. The Czech villages and towns with their Church steeples and painted roofs not only looked more picturesque than what we had seen in U.S.S.R. but also indicated a definitely higher standard of living. We reached Prague in the afternoon. It appeared that unlike Stalingrad or Warsaw, Prague was singularly fortunate in escaping the ravages of the War.

Prague.

2. On the 11th October we visited the Czech Ministry of Foreign Trade as well as the Ministry of Agriculture and the Planning Commission and did some sight-seeing in the city of Prague. Prague is the centre of beautiful baroque architecture and has some of the finest buildings in Europe. Although the people of Prague appeared to have a higher standard of living than the people of Moscow, their clothes were more drab and their general appearance less happy than what one used to see before the War. We noticed considerable dissatisfaction against the Communist regime amongst a large section of the people, especially amongst those who belonged to the erstwhile middle class. We also sensed a greater feeling of fear in Prague than we had done in Warsaw or Moscow. Moreover, Czechoslovakia gave one the impression of being entirely subservient to U.S.S.R. Apart from the pictures of Lenin and Stalin, portraits of Malenkov, Molotov, etc. were more numerous in Czechoslovakia than even in U.S.S.R. In fact this was a contrast with Poland where the portrait of the Prime Minister, Mr. Bierut, had the position of pride and portraits of Malenkov or Molotov were conspicuous by their absence. The Czechoslovak Government are building in the centre of Prague a huge statute of Stalin which they proudly claim will be the largest in the world—even larger than the one we saw on the Volga-Don canal in U.S.S.R. They are also building a palace for the Prague University which is an exact replica of the Moscow University and a contrast to the traditional architecture of Prague.

Skoda Works. 3. We spent 4 days in Czechoslovakia and had an opportunity of paying a visit to the famous Skoda Factory now renamed the Lenin Factory at Pilsen and a State Farm at Malnik and a Machine Tractor Station at Hornatka. The famous Skoda Factory needs no introduction here. It was very badly damaged during the War but has been completely rebuilt and was working in full swing when we visited it. It was manufacturing machine tools for the U.S.S.R. factories and also equipment for the U.S.S.R. Navy besides railway engines, turbines, etc. for China. Here also we noticed the same lack of confidence amongst the technical officers that we had noticed in Poland and which was such a contrast to the attitude of the U.S.S.R. factory managers and other technical officers. The Skoda Factory is also being controlled by a member of the Communist Party and no technical officer dared give us any information without first checking it with him.

4. The system of planning in Czechoslovakia is the same as in U.S.S.R. and in Poland. In a sense it is nearer Poland than U.S.S.R. Unlike U.S.S.R. agricultural planning in Czechoslovakia is done on the basis of a village and a district rather than of a collective farm. This is, of course, understandable because like Poland in Czechoslovakia also agriculture is still largely based on the individual peasant proprietor although there are a number of co-operative farms and State farms. The

State Farms. number of State farms in Czechoslovakia is, however, much smaller than in Poland and these have been established mostly in lands expropriated from the Germans. On the average there is one State farm in each district. The State farm, which we visited at Malnik, had 5,300 hectares of arable land and 2,700 hectares of pasture, vine yard, etc., and produced mostly wheat, barley, potatoes, sugar-beet and fodder. It had 2,500 cows, 360 horses, 200 sheep and 2,000 pigs and owned all its machinery which included 60 tractors of which 14 were the U.S.S.R. tractors and the rest Czech tractors, either Caterpillar or Zetor. The farm did not consist of one compact area but was split up into 8 fragments each of which was in charge of a separate division. Total number of employees was 1,700 and they were all paid according to labour day units. Average pay for one labour day unit was 25 to 30 korunas and the average number of labour day units earned by a worker was 300 per annum. Average income of a female worker was 800 korunas per month and of a male worker 1,000 to 1,500 korunas per month. Average yield of wheat was 28 quintals per hectare and cost of production 55 to 60 korunas per quintal.

M.T.S. 5. Czechoslovakia has no Commune Machine Stations as in Poland. There are only Machine Tractor Stations. These are more or less modelled on the Russian M.T.S. although on a smaller scale. They seemed, however to be much better organised and managed than Russian

M.T.Ss. This is not surprising because Czechoslovakia has a very long industrial tradition and it is quite natural that the Czechs would be able to manage their Machine Tractor Stations more efficiently. We were told that in 1945 certain machine co-operatives, which were somewhat like Polish Commune Machine Stations, had been started in Czechoslovakia also but these were misused by the farmers and so in 1948 they were abolished and replaced by State Machine Tractor Stations. There are today altogether about 250 Machine Tractor Stations, one in each district—each divided into a number of brigades having a few tractors in different places of the district. Each Machine Tractor Station possesses on the average 70 to 100 tractors of 30 to 80 H.P. each. The smaller tractors are all of Czech manufacture whereas the bigger tractors are mostly Russian although there are a few American tractors also. Each M.T.S. has a staff of 150 to 250, including the Director, agronomist, zoo-technician, engineer, mechanic, etc. The Machine Tractor Stations are grouped into a number of Regional Directorates. The Machine Tractor Station which we visited at Hornatka was one of the biggest and owned 24 Russian caterpillar tractors, 80 Czech wheel tractors and 10 combines. It had 250 employees divided into 5 brigades. It served 65 villages within a distance of 40 kilometres from Headquarters. It had ploughed 70,000 hectares of land last year. The charges for ploughing varied according to soil and were higher for private farmers. The average rate for ploughing was 100 korunas per hectare for co-operative farms and 115 korunas for private farms. It seemed to be the general practice in Czechoslovakia to give similar preferences to co-operative farms as compared to private farmers, not only in the matter of tractor charges but also for interest on loans, fertilizer prices, etc.

Co-operative Farms.

6. 53% of the total arable area in Czechoslovakia is cultivated by the private farmers, 38% by collective and co-operative farms and 9 per cent. by State farms. There are altogether 7,000 co-operative farms in Czechoslovakia, each co-operative farm comprises of a village and possesses about 300 hectares of land. These farms can be divided into the same four types as have been described in the case of Poland. Most of them belong to the second or third types while only 800 belong to the fourth type or the collective farm type. State control over both co-operative farms and individual farmers seemed to be much more tight in Czechoslovakia than in Poland. Quotas for obligatory deliveries are fixed not only for each co-operative farm but also for each private farm. Besides these there are also large voluntary deliveries. There was recently a reduction in the obligatory quotas following the Russian lead in 1953 but the reduction has been much smaller for private farms than for co-operative farms. Unlike in Poland targets of production

are fixed even for individual farmers. For farmers owning less than 2 hectares only the area to be sown is indicated. For bigger farmers both the area to be sown and the yield per hectare to be aimed at for different crops are indicated. Similarly detailed targets are also fixed for cattle, pigs, etc. Cultivation in Czechoslovakia seemed to be generally much more intensive than in Russia.

District and Village Planning Committees.

7. As has been mentioned earlier planning in agriculture is done mainly on the village and district basis. There is a Village Planning Committee elected for 4 years with a membership of 20. This Committee has power to compel a recalcitrant member and can even take away land from him. We were told that this power had to be given because there were a number of middle farmers who refused to co-operate with the Planning Committee. Above the Village Committee there is a District Committee which is elected directly. This District Committee gives necessary directives to Village Committees, supervises their work and maintains roads, hospitals, etc., in the district. It is in charge of district agricultural planning and has a full-time paid staff. The District Committee gets a percentage of the taxes collected in the district as also income from village forests, local entertainment, etc. Above the District Committee there is a National Planning Committee and also the Ministry of Agriculture for the agricultural sector of the Plan. The agricultural staff at the province and district levels is controlled by the Ministry of Agriculture.

Progress of Czech Agriculture.

8. The territorial structure of Czech agriculture underwent important changes in the years 1949—53. In this connection the substantial increase in agricultural production in Slovakia whose development was lagging considerably behind in the pre-war period may be mentioned. The gross value of crop production increased by over 18% between 1949 and 1953. This was achieved mainly by intensive cultivation. Per hectare yield of grain increased by 21% and of potatoes by 13% during this period. Agricultural co-operatives and State farms have contributed to a very large extent in achieving this higher yield per hectare. The share contributed by co-operative farms to total production was 44% in the case of wheat, 38% for rye, 44% for barley, 39% for oats, 34% for potatoes and 47% for sugar-beet. The gross value of livestock production has gone up by 23%. The share of the State and co-operative farms in deliveries to the State amounted in 1953 to 51% for grain, 56% for sugar-beet, 57 per cent. for hogs, although as has been mentioned earlier these farms account for only 47% of the total arable land. It is claimed that the productivity of labour is highest in the State farms. Then come co-operative farms while the individual farms come last. We were told that this was largely due to the assistance received from the Machine Tractor Stations

which in 1953 possessed a total of over 14,000 small tractors, 1,100 combines and 13,500 grain harvesting machines and carried out the ploughing of 49% of the total land and reaped 35% of all land sown to grain. The use of nitrogenous fertilizers increased by 34%, of phosphatic fertilizers by 11% and of potassium fertilizers by 164% between 1949 and 1953. Still as in the case of U.S.S.R. and Poland, the progress in the agricultural field fell far short of the progress in the industrial field. The Czech Government, therefore, took in 1953 the same type of measures which were taken in U.S.S.R. They relaxed considerably control over individual farms, reduced the obligatory deliveries of agricultural products to the State to a considerable extent and also increased the purchase price. Large credit was provided and the rate of interest charged to cooperatives was reduced from 3% to 1½%. Our general impression of Czech agriculture was that it was more efficient than Polish agriculture but it was subject to a greater degree of State regulation. But this is perhaps due more to the traditional efficiency of the Czech farmer than to measures taken by the State in recent years. In fact, in Czechoslovakia much less service is provided to the individual farmer compared to Poland. There seemed also to be a strained relation between Czech Government and middle farmers. We got the impression that unlike Poland but like U.S.S.R. in the early twenties, the Czech Government is perhaps trying now slowly to squeeze out this class. The organisation of the Czech Machine Tractor Stations, however, appeared to be better than that of those which we saw in Poland or in U.S.S.R. One interesting thing in Czechoslovakia is that unlike in Poland or in U.S.S.R. they are making a large scale use of the small garden tractors *vide* Appendix VII). These garden tractors which are similar to German models may prove to be useful supplement to bullock power in small farms in certain parts of India. Otherwise we doubt if we can make much use of the agricultural implements or tractors manufactured in Czechoslovakia. In the first place these are of the same type that we get from Germany or U.S.A. and are not likely to be cheaper. Secondly we do not think that Czechoslovakia has much surplus to spare. Czechoslovakia may be, however, of more help in the industrial field and in the provision of technical assistance. Technical base of Czech industry as well as agriculture is more or less of the German type whereas the basis of organisation is now being made to conform more and more to the U.S.S.R. pattern.

9. As has been mentioned earlier, the economies of both Poland and Czechoslovakia have been closely integrated with that of U.S.S.R. Prices of various commodities are more or less of the same order. The cost of living is equally high in all these three countries. The only difference is that while the lowest incomes in all these three

countries are more or less at the same level, the highest in U.S.S.R. is about 4 times the highest in Poland or in Czechoslovakia. The ratio between the lowest and the highest income would be about 1 to 15 in Czechoslovakia and Poland as against 1 to 60 or even more in U.S.S.R.

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CHAPTER XIX

RECOMMENDATIONS

1. Our conclusions regarding various aspects of the U.S.S.R., Polish and Czechoslovak agriculture have been given in appropriate places and we do not propose to increase the size of this report which is already rather bulky, by recapitulating them. Before we conclude, however, we propose to give some broad indications as to what technical benefit India can derive from the progress in the agricultural field achieved in these three countries. We were told by the U.S.S.R. authorities that they were making a substantial contribution in roubles to the U.N.O. Technical Assistance Fund every year and that almost the entire amount was lying unutilised. They urged us to draw upon this Fund liberally and ask for whatever machines or experts we might require from U.S.S.R.

2. But as we have explained earlier, in the field of agriculture, U.S.S.R. is going in for bigger and bigger farms and conditions there are very different from conditions in India. Early in the thirties, millions of small farms were organised into a couple of lakhs of collective farms. One of the objectives was to introduce a greater degree of mechanisation and to economise labour. U.S.S.R. has an abundance of land and a shortage of labour. Hence, this policy may be justified for her. But the people in U.S.S.R. themselves agree that it would not be suitable for countries like China or India where population is very large relative to the supply of land. Most of the agricultural machines manufactured in U.S.S.R., *e.g.*, diesel and electric tractors, combine-harvesters, cotton pickers, potato diggers, etc., although technically quite efficient, are suitable only for big collective farms. Hence, most of them are not likely to be of interest to the small Indian farmer. There are, however, a few items, *e.g.*, the multi-purpose tractor and machinery and equipment for land reclamation, irrigation, drainage, forestry and fisheries, which may be of interest to the relatively big farms and the Government Departments in India, provided the U.S.S.R. authorities make the price sufficiently attractive and arrange for adequate supply of spare parts and repair services in India. They appear to be conscious of this and are prepared to appoint reliable Indian trading houses as their agents and sell even on a consignment basis. These machines will have, however, to be tried under Indian conditions before their importation on any large scale can be recommended. We may take advantage of the U.S.S.R. offer of technical assistance referred to above for getting

some of these machines for trial under Indian conditions. In general, our impression was that the agricultural machines in U.S.S.R. are strong and good enough for the purpose for which they are built. But they do not have quite the finish of the machines obtainable from Western countries. It appears that the Russians concentrate on only a few standard models and change these models much less frequently than in Western countries. They do not also care much about the finish of a machine so long as its performance is satisfactory.

3. In the field of fertilizer practices, U.S.S.R. has made very good progress. They are carrying out large scale experiments with bacterial fertilizers, *e.g.* Nitragin, Azota bacterin, Phosphobacterin, etc., which should be of considerable interest to a country like India as they are very much cheaper than other forms of fertilizers. Another point of interest to us is that they are making a much greater use of granulated non-hygroscopic ammonium nitrate compared to ammonium sulphate as they find that the latter has an undesirable acidic effect on the soil. We were given an impression that it may be possible to get plants for manufacturing bacterial fertilizers and granulated ammonium nitrate from U.S.S.R. on long-term credit terms similar to those which the U.S.S.R. has recently offered for a steel plant.

4. In the field of plant breeding and animal breeding, scientists in U.S.S.R. have done good work. They have evolved varieties of wheat, maize, cotton, sheep and cattle which are amongst the best in the world. In both these fields exchange of scientific information between Indian scientists and Russian scientists should be useful. In fact, the research work done in U.S.S.R. in the field of agronomy and animal husbandry has been of a very high quality. U.S.S.R. spends about 500 million roubles every year on agricultural research. She has also a very strong extension organization. Some of the extension methods of U.S.S.R., especially the organisation of exhibitions, partly for popularising improved techniques but largely for fostering a spirit of competition amongst farmers may be perhaps usefully tried in India—of course on a smaller scale and after suitable modification and adaptation.

5. It is, however, doubtful if in other fields of agriculture, India can derive much benefit from the experience of U.S.S.R. Apart from differences in weather and soil conditions, in U.S.S.R. the emphasis is largely on extensive cultivation while in India it has to be on intensive cultivation on account of the difference in the land-man ratio. The farmer in U.S.S.R. takes much less care of his land than the Japanese or the Italian or even the Indian farmer does.

6. In Poland and Czechoslovakia there are still many small farms and a large number of implements are being manufactured which are useful for the small farmer. But these are not dissimilar from the modern implements with which we are already familiar and most of them can be manufactured in India. We may be interested in some of these implements and also in the Ursus tractors of Poland and garden tractors of Czechoslovakia if the price is sufficiently low and the importers agree to provide an adequate supply of spare parts and after-sale service. The experience of Czech Machine Tractor Stations and Polish Commune Machine Stations may have also useful lessons for India inasmuch as they are catering to the needs of co-operative farms and small peasants.

7. The most remarkable lesson that we can learn from these countries is, however, the great determination to lift agriculture from the old ruts and to utilise to the utmost the achievements of modern science and technology to convert it from a mere way of life to a modern industry where it is man and not nature who is the real master. The progress towards this goal has not been uniform in all areas and much remains to be done but we have no doubt that technical conditions are being rapidly created in all these three countries which would go a long way towards the achievement of this goal. The problem which still remains, however, to be tackled satisfactorily, not only in these three countries but in many others, is the human factor—the problem of incentives and disincentives and of organisation. But for that we suppose each country will have to find its own solution and no golden rule can be prescribed.

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APPENDIX 1

LIST OF MEMBERS OF THE JOINT INDUSTRIAL AND AGRICULTURAL DELEGATION

1. Shri Kasturbhai Lalbhai
2. Shri S. P. Jain
3. Shri Kamalnayan Bajaj
4. Shri S. L. Kirloskar
5. Dr. S. P. Sen
6. Dr. M. D. Parekh
7. Shri T. S. Krishna
8. Shri P. R. Menon
9. Shri P. N. Deobhakta
10. Shri Tarlok Singh
11. Dr. S. R. Sen
12. Shri C. P. Srivastava
13. Dr. P. M. Narainswamy Naidu
14. Shri Abdul Rauf Kidwai
15. Shri K. V. S. Murthy

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APPENDIX II

PROJECT OF THE PLAN OF DEVELOPMENT OF AGRICULTURE IN A COLLECTIVE FARM IN U. S. S. R.

A. General Information

S. No.

1. No. of Buildings . . .
   (House-holds)

2. Total Population . . . (Persons)

3. Those able to work . . . (Persons)
   In these : Males . . . (")
   Females . . . (")
   Besides that youths between 12 to 16 . (Persons)

4. Total land area attached to the Collective Farm . . . . . (Hectares)
   In that :—Cultivated . . (Hectares) in this included for
   Rotations . . (")
   Hay-growing . . (")
   Forests . . . (")
   Vegetables . . . (")
   Shrubbery . . . (")
   Sands . . . (")
   Under Water . . (")
   Ravines or Gullys . (")
   Pastures . . . (")
   Orchards . . . (")
   Private Plots . . (")
   Swamps . . . (")
   Roads and Paths . . (")
   Others . . . (")
   Besides that, total forest and State lands allotted to the collective Farm . (hectares)
   In these for : Cultivation . . (hectares)
   Hay growing . (")
   Pastures . . (")

5. From the total land : (Under Private title) (hectares)
   In that for: Cultivation . . (hectares)
   Hay growing . . (")
   Pastures . . (")
   Other purposes . (")

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A. General Information —contd.

S. No.

6. Out of the total land in the Collective Farm	(Hectares)	
In that for : Cultivation .	(”)	
Hay growing	(”)	
Other purposes	(”)	

		1954	1955	1956
7. Reclamation of Virgin and Waste land :—				
For Cultivation	(hectares)			
For pastures . . .	(”)			
For Hay growing . . .	(”)			

8. The existing rotations are in accordance with the plans of the National Economic Land Organisation re-examined in accordance with the decision of the February-March meeting of the Central Committee of the Communist Party of Soviet Union.

B. Crop Rotations

Existing		Revised (Planned)	
Types of fields, fodder, special and other crop rotations (Indicate the succession of crops).	Areas in Hectares in each crop rotation.	Types of fields, fodder, special and other crops rotations (Indicate the succession of crops).	Area in hectares in each crop rotation.

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C. Agricultural Crops, Animal Husbandry, etc.

No.	Name of the work	unit of Measurement	1953 (Actual)	1954 (Estimated fulfilment)	1955 (Plan)	1956 (Plan)
1	2	3	4	5	6	7
1.	**Area under spring and Winter sowings in Collective Farms**					
	Total Sown Area . .	Hectares				
	Spring Sowing (excluding area sown to grass in previous years) . .	”				
	Winter Sowing of Grain Crops to be harvested next year . . .	”				
	Of this : Wheat . .	”				

C. Agricultural Crops, Animal Husbandry, etc.—contd.

1	2	3	4	5	6	7
2.	**Sowing of Grain Crops**					
	Grain crops . . .	Hectares				
	Out of the total grain crop area :					
	Winter crops—Total .	”				
	Of these: Wheat .	”				
	Spring crops—Total .	”				
	Of these : Wheat .	”				
	Oats .	”				
	Barley .	”				
	Legumes .	”				
	Maize .	”				
	Millets .	”				
3.	**Sowing of Industrial Crops**					
	Industrial Crops—Total	”				
	Of these : Sugar-Beet .	”				
	Inferior Tabacco	”				
	Sun-flower.	”				
	Hemp .	”				
	Mustard .	”				
4.	**Sowing of Potatoes, Vegetables & Fruit Crops**					
	Potatoes: Vegetables & Fruit Crops—Total .	”				
	Of these : Potatoes .	”				
	Fruit crops.	”				
	Vegetable crops	”				
5.	**Sowing of Fodder Crops**					
	Total fodder crops including grasses sown in previous years . .	”				
	In these : Annual Grasses .					
	Total Grasses	”				
	From these dried for fodder . . .	”				
	Rye for fodder sown in the last year . .	”				
	Perennial Grasses—Total	”				
	Fodder : Root crops .	”				
	Fodder : Fruit crops .	”				

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C. Agricultural Crops, Animal Husbandry, etc.—contd.

1	2	3	4	5	6	7
	Silage crops . .	Hectares				
	In these : Maize (corn)	,,				
	Perennial Grasses	,,				
	sown in previous years Total .	,,				
	Besides that :— . .					
	(a) Current sowing of Perennial Grasses	,,				
	(b) Sowing of winter rye for fodder to be harvested next year . .	,,				
6.	**Sowing of Vegetables & Fruit Crops in Seed Cultivating Collective Farms**					
	Vegetable crops—Total .	,,				
	In these: Transplanted .	,,				
	Fruits for Eating	,,				
	Fruits for Fodder	,,				
7.	**Walling up and making new Hotbeds and Warm-Springs under Vegetable Crops**					
	Walling up of hotbeds :—					
	For vegetable crops .	Frames				
	For Inferior tobacco .	,,				
	Walling up of hot-houses (warm springs) . .	Sq. metres				
	New construction of hotbeds—Total . . .	Frames				
	Of these : Under walling current year . . .	,,				
	New construction of hot-houses. . . .	Sq. metres				
	Construction of Seed-pots .	No.				
8.	**Preparation of seed for Grasses** . . .					
	(a) Perennial . .					
	(b) Annual . . .					
9.	**Stocking of Fodders**					
	Cutting of natural grasses .	Hectares				
	Cutting of sown grasses	,,				
	Stocking of hay	Ton/Cwt.				

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C. Agricultural Crops, Animal Husbandry, etc.—contd.

1	2	3	4	5	6	7
	Stocking of straw for cattle fodder . . .	Ton/Cwt				
	Stocking for spreading on floor of animal-sheds and other needs . .	,,				
	Fodder from root crops, fruit crops and potatoes	,,				
	Silage	,,				
10.	**Sowing of Fodder Crops on Low-yield, Hay-fields and Pastures.**	Hectares				
11.	**Increase of Irrigated Land due to New Construction.**	,,				
12.	**Reclamation of un-utilized Lands by Irrigation.**	,,				
13.	**Sowing on Irrigated Lands**					
	Total Sown area . .	,,				
	In that : Grains .	,,				
	Of these :Spring . .	,,				
	Industrial Crops . :	,,				
	Fodder crops together with grasses sown during previous years—Total .	,,				
	Of these : Perennial Grasses sown during previous years . . .	,,				
	Potatoes & Vegetables:					
	Potatoes . . .	,,				
	Vegetables . . .	,,				
14.	**Construction of Artisan-Wells in Collective Farms**	No.				
	Construction of Ponds .	,,				
		With area				
15.	**Walling up of Fruit-berry and Grape Plantings and Nurseries**					
	Walling up in Collective Farms :— . . .					
	Of Gardens . . .	Hectares				
	Fruit-Berry gardens . .	,,				
	Grape Orchards . .	,,				
	Of Nurseries					
	(a) Fruit-Berry (rotation field) . . .	,,				
	(b) Grapes . .	,,				

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C. Agricultural crops, Animal Husbandry, etc.—contd.

1	2	3	4	5	6	7
16.	**Walling up of mulberry Plantings and providing Cocoons in Collective Farms**					
	Sowing of Mulberry-tree (seedings) in the nurseries—Total	Hectares				
	Walling up of Saplings in Mulberry-tree nurseries-Total	”				
	Walling up of Mulberry-tree plantations . .	”				
	No. of big Mulberry-trees	thousands				
	Stocking of Cocoons:					
	Mulberry Silk-moths .	Cwts.				
	Oak Silk-moths . .	”				
17.	**Afforestation**					
	Sowing and planting of protected forest tracts .	Hectares				
	Extension of forest tracts .	”				
	Plantings of previous years	”				
	Sowing in collective-farm nurseries . . .	”				
	Preparation of soil for afforestation next year .	”				
18.	**Basic Agro-Technical measures in the Collective Farms**					
	Tilling of early-fallow for Winter Crops . .	”				
	Tilling of fallow for Spring Crops . . .	”				
	Ploughing of virgin fallows for grain-crops (including black-fallows raised during Autumn of the current year) . . .	”				
	Weeding	thousand hectares				
	Ploughing of black-fallows in Autumn for next year's sowings . . .	hectares				
	Ploughing of cultivated land	”				
	Sowing of Summer potatoes	”				
	Carting of dung (manure) to fields . . .	tons				

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C. Agricultural crops, Animal Husbandry, etc.—contd.

1	2	3	4	5	6	7
	Storing of dung for hot-beds and hot-houses	tons				
	Sowing by the square-bung-hole method—Total	hectares				
	In that: Sun-flower	,,				
	Maize (corn)	,,				
	Fruits for eating	,,				
	Potatoes	,,				
	Vegetables	,,				
	Fruit Fodders	,,				
19.	**Yield of crops**					
	Average of all grains	cwts. per Hectare				
	In that: Wheat-winter	,,				
	Rye-winter	,,				
	Wheat-spring	,,				
	Oats	,,				
	Barley	,,				
	Legumes (average)	,,				
	Maize (corn)	,,				
	Millets	,,				
	Sugar-Beet	,,				
	Inferior tobacco	,,				
	Sun-flower	,,				
	Linseed	,,				
	Mustard	,,				
	Potatoes	,,				
	Vegetables	,,				
	Eatable fruits	,,				
	Silage crops	cwts.				
	Fruit-fodders	,,				
	Hay: (a) Perennial grass	cwts. per hectare				
	(b) Annual grass	,,				
	(c) Natural hay	,,				
20.	**Number of Productive Cattle and Poultry on Ist October**					
	Cows	Number				
	Total number of big-horned cattle	,,				

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C. Agricultural crops, Animal Husbandry, etc.—contd.

1	2	3	4	5	6
	Sheep and goats : total	Number			
	In that : Sheep . .	,,			
	In these : Fine-wool sheep	,,			
	Medium-fine-wool sheep	,,			
	Coarse-wool sheep	,,			
	Swines (she-pigs) . .	,,			
	Total number of Pigs .	,,			
	Total Poultry . . .	,,			
	Of these : Egg-producing—hens . .	,,			
	Geese . .	,,			
	Ducks . .	,,			
	Turkeys .	,,			
	Bee-swarms . . .	,,			
	Rabbits (female only) .	,,			
21.	**Productivity of Cattle** .				
	Yield per one milking of a forage cow . . .	kilogrammes			
	Yield per shearing of sheep	,,			
	From: Fine-wool Sheep .	,,			
	Medium-fine-wool Sheep	,,			
	Medium-coarse-wool Sheep	,,			
	Coarse-wool Sheep .	,,			
	Big-horned cattle taken off from further fattening and loitering .	No.			
	Sheep-taken off from further fattening and loitering .	,,			
	Pigs-taken off from further fattening and loitering .	,,			
22.	**Cross-Breeding and Artificial Insemination of sheep and cows**				
	Cross-breeding of sheep with Fine-wool and Medium-fine wool Rams.	,,			
	Artificial insemination of Sheep with Fine-wool and Medium-fine wool Rams	,,			
	Artificial insemination of cows	,,			
23.	**Construction of cattle-sheds, Silage Towers and grain-elevators**				
	Cattle-sheds . . .	Animal Places			
	Calves-sheds . . .	,,			
	Pig-sheds . . .	,,			
	Sheep-sheds . . .	,,			
	Poultry-sheds . . .	,,			

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C. Agricultural crops, Animal Husbandry, etc.—concld.

1	2	3	4	5	6	7
	Chicken-sheds . . .	Animal places				
	Horse-sheds . . .	"				
	Silage towers/medium towers	capacity in tons				
	Grain elevators	"				
24.	**Mechanisation of Difficult works in Cattle-Breeding Farms**					
	Water-supply . .	No. of farms				
	Water feeding of Big-horned cattle by automatic-water feeder	"				
	Electro-mechanical milking of cows . . .	"				
	Transport within the farm	"				
	Preparation of concentrated fodders . .	"				
	Preparation of coarse fodders	"				
	Preparation of juicy fodders	"				
	Stewing of fodders . .	"				
	Electro-mechanical shearing of sheep . . .	No.				

Chairman of the Collective Farm	Director of the M. T. S.
Agronomist of the Collective Farms . . .	Chief Agronomist
	Chief Zoo-Technician

APPENDIX III

MACHINE TRACTOR STATIONS IN U. S. S. R.

(a) Sanctioned Strength of a Typical Establishment

S. No.	Designation	No.	Pay in Roubles per month
1	Director	1	1,600-1,700
2	Chief Engineer	1	1,500-1,700
3	Chief Agronomist	1	1,500-1,700
4	Chief Zoo-technician	1	1,500 1,700
5	Chief Veterinary Doctor	1	1,600
6	Chairman (Repair)	1	1,100-1,300
7	Engineer (Mechanical)	1	1,100
8	Chief of Mechanization (Animal Husbandry)	1	1,100
9	Engineer (Agricultural Machinery)	1	1,100
10	Wireless Operator	1	900
11	Mechanic (per twenty tractors)	1	900
12	Agronomists for the collective farm		900
13	Soil Chemist	1	1,400
14	Chairman (Chemical Laboratory)	1	900
15	Welding Technician	1	1,100
16	Agricultural Ecomomists		800-900
17	Technician I/C Norms		
18	Chief Accountant		
19	Accountants	3	
20	Accountant (for repair shop)		
21	Economists I/C Labour		900
22	Chief Inspector of Accounts of Collective Farms		1,000
23	Superintendent—Establishment		600
24	Secretary Typist		800
25	Head Clerk		500
26	Implement Storekeeper		500-600
27	Cleaner for Office		350
28	Horse Driver		350-400
29	Vegetable Agronomist		1,350
30	Food Agronomist		800
31	Technological Agricultural Agronomist		800
32	Soil Culture Agronomist		800
33	Tea Planter Agronomist		900
34	Mycologist		900
35	Forestry Expert		900
36	Irrigation Expert		1,100
37	Insect Pests Technologist		800
38	Mechanic (per 10 vehicles)	1	800

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(a) Sanctioned Strength of a Typical Establishment—contd.

S. No.	Designation	No.	Pay in Roubles per month.
39	Designer		1,100
40	Expert for Plantation of Peas and Vegetables		1,100
41	Technician I/C Electric Tractors		1,100
42	Technician for the Power House		800 (In case of Power 30 KW)
43	Pumping Expert I/C of 10 Centrifugal Pumps		800
44	Ground Water Driller		800
45	Expert on Seeds and Their Preservation		800
46	Engineer I/C for cotton machinery		1,100
47	Tractor Drivers	According to the requirements of the M.T.S.	

(b) Equipment for an M. T. S. serving Grain Farms between 10,000 to 16,000 Hectares

S. No.	Nos.	Uses of the Tractors
1 **Tractors**		
S80 (Diesel)	5	Ploughing, dozing, grading and road making and for other heavier jobs.
DT54	15	Ploughing, cultivation and breeding of soil.
KD35 KDP35	30	Ploughing and cultivation between rows.
MTZ (Wheel Type)	20	
FTZ7 (Petrol)	10	Gardening and working the tooth pick harrows.
20 HP Tractor		Gardening and cultivation between rows.
TOTAL	80	
2 **Combines**		
Type C4	10	
Stalinets 6 (Tractor Drivers)	20	
Maize Combines	10	
Selo Combine	10	(only for southern regions)
Potato combines	10	
TOTAL	60	

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(b) Equipment for an M. T. S. serving Grain Farms between 10,000 to 16,000 Hectares—contd.

S. No.		Nos.	Uses of the Tractors
3	**Ploughs**		
	Mould Board Ploughs (Trailing Type)	30	
	Hydraulically operating mould board ploughs	30	
	TOTAL	60	
4	**Harrows**		
	Tooth pick Harrows	200	
	Disc Harrows	20	
	Cultivators	50	
	TOTAL	270	
5	**Seed Drills**		
	Seed Drills for grain	100	
	Potato Planters	20	
	TOTAL	120	
6	**Miscellaneous**		
	Maize, Flax, Sun-Flower Sieves	20	
	Grain cleaning machines	10	
	Manure Spreaders	10	
	TOTAL	40	
7	**Earth Moving Equipment**		
	Dozers, Ditchers, Grades, Excavators		According to the requirements.
8	**Transport Vehicles**		
	Mobile Workshops	3	
	Vehicles for transporting of fuels	10	
	Cars for the use of officers	5	
	TOTAL	18	
9	**Animals**		
	Horses for Transporting of Vegetables and Farm Produce	10	

(c) Standard Workshop Equipments for Machine Tractor Stations in U.S.S.R.

		No.
Lathe	300 × 1500 m.m.	1
Lathe	200 × 1000 m.m.	1
Lathe	175 × 750 m.m.	1
Drill	35 m.m.	1
Radial Drill	12 m.m.	1
Milling machine	320 × 150 m.m.	1
Wood working Lathe		1
Planning machine for wood work		1
Cylinder grinding machine	165 m.m.	1
Cylinder honing machine	165 m.m.	1
Valve refacer		1
Automatic valve grinding machine		1
Tool post grinders		3
Electric Power Hammer	50 k.g.	1
Fuel injection testing machine		1
Oil pump testing machine		1
Radiator testing machine		1
Hydraulic testing machine for cylinder heads		1
Washing machine for cleaning engine parts (under pressure)		1
Washing machine for tractor chassis (under pressure)		1
Crank shaft grinding machine	1,600 m.m.	1 for 10 M.T.Ss.
Track pin press	100 tons	1
Key press	3 ”	1
Gas-heating furnace		1
Blower-furnace		1
Electric welding generator		1
Acetylene generator and equipment for gas welding		1
Crane	3 tons	1
Chain Pulley block	3 tons	1
Jacks	3 tons	2
Jack	5 tons	1
Winch	3 tons	1
Rail track for moving engine and parts inside the workshop and platform type trolley for moving engine and tractor parts inside workshop		
Electric furnace for heating and melting soft metals		1
Necessary set of fittings and fixtures for casting bearings		1
Main bearing boring Jig and Tool bar		1 Set
Spring compression testing machine		1
Carburettor jet testing machine		1
Ball bearing testing machine		1
Set of tools for pipe cutting and flarring		1 Set
Universal Electric testing machine for magneto, coils, plugs, etc.		1
Magnetiser		1
Magnetometer		1

(c) Standard Workshop Equipments for Machine Tractor Stations in U.S.S.R.—contd.

		Nos.
Crawler		1
Neon tester		1
Capacity meter		1
Electric dryer		1
Set of tools for electric repairs		1
Set of mercer gauges, callipers, micrometers, depth gauges and angular gauges		1
Stoves for heating and melting bearing metal		1 Set.
Electric sawing machine		1
Polishing machine		1
Compression testing meter		1
Hydraulic press	40 tons	1
Universal press (Manually operated)	10 tons	1
Work benches and stands for engines		No. to suit the requirements of M.T.S.
Work benches and stands for cylinder heads		Do.
Set of valve seat cutting tools (pneumatic)		1
Set of stones for finishing valve seats		1
Set of Ridge Reamers		1
Piston and connection rod alignment gauge		1
Leather polishing machine		1
Work benches	450 × 600 m.m.	Necessary Nos.
Piston Ring Extractor and Ring Compressor.		2 or 3
Battery charging outfit		1 Set.
Dynamometer (water type)		1
Equipment run with an electric motor or engine for lapping pistons rings, bearings, etc. Stethoscope for checking noises in engine		1
Face plate		1
Special set of tools for the types of tractor in use		1 set for each type of tractor
Stand for washing nuts and bolts		1
Electric motors 20 KW.		3
100 HP Power Plant with generator		1
Diesel engine generating set 45 HP		1
Compressor for working hoist		1

NOTE.—Besides the above tools, complete set of tools and machinery is provided in the M. T. S. for over-hauling and repairs of harvester combines, threshing machines and other agricultural machinery and equipment.

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(d) Break up of Repairing Charges and Norms for Repairs to Tractors

The economic life of a tractor is taken as 6 to 7 years during which period the expense on repairs are spread over as indicated :—

1st Year	15%
2nd Year	20%
3rd Year	20%
4th Year	25%
5th Year & after.	Depending on condition and work involved.

Provisioning of spare parts is fixed on the basis of a fleet of 100 Tractors.

25% Spares are stocked by M.T.S.
50% ” ” ” ” at Regional offices.

The cost of repairs is divided in the following order :—

Wages of Workers	20%
Spare Parts	55%
Over-Heads	10%
Raw Material	5%
Wages of additional Technicians . .	10%

There are norms fixed for repair jobs in terms of hours as well. Some of them are as follows :—

Tractor/Other work	Major overhauling of Tractor and its Engine	Top overhauling or Repairs	
S.80 (Diesel)	180 Hrs.	105 Hrs.	30% reduction is made if a factory reconditioned engine is used on overhauling.
D.T.54 (Diesel)	126 Hrs.	75 Hrs.	
Repairs to Clutch mechanism .		9 Hrs.	
Gear Box		18 Hrs.	
Final Drive (Complete overhauling) . .		71 Hrs.	
Governor		12 Hrs.	
Front Axle		16 Hrs.	

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APPENDIX IV

SPECIFICATIONS OF TRACTORS IN U.S.S.R.

(a) Stalinetz 80 (S 80)

Characteristics	Caterpillar Type	
	Wt. of Tractor	11,400 kgm.
	Overall dimensions	length—4228 m.m. Width—2456 m.m. Height—2767 m.m.
	Wheel base	1880 m.m.
	Road Clearance	382 m.m.
Engine	Four cylinder—4 Cycle—Diesel Engine.	
	Engine Power—80 HP	Nominal.
	93 HP	maximum nominal.
	R. P. M.	100.
	Cylinders arranged vertically.	
	Bore	145 m.m.
	Stroke	205 m.m.
	Compression Ratio	15·5 : 1
	Firing Order	1-3-4-2
Starting Engine	2 Stroke—2 Cylinder—Petrol Engine—19 HP	
	2600 R.P.M.—Bore	92 m.m.
	Stroke	102 m.m.
Transmission	Clutch—Single Plate dry type,	
	5 forward and 4 reverse Speeds	
	Speed in k. ms./Hr	*Forward* 1st Gear 2·25 2nd ,, 3·60 3rd ,, 5·14 4th ,, 7·40 5th ,, 9·65 *Reverse* 1st Gear 2·66 2nd ,, 4·25 3rd ,, 6·10 4th ,, 8·75
Driving Mechanism	Caterpillar Type	
	36 No. Track Shoes with grousers on each track	
	Links	500 m.m. wide.

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(a) Stalinetz 80 (S. 80)—contd.

Electric Equipment Generator—250 Watts—12 Volts.
Two Head Lights—21 Watts each
Two Tail Lights.

(b) Dt. 54

Characteristics Caterpillar Type.

Wt. of Tractor	5400 kgm.
Overall dimensions	Length—3660 m.m. Width—1865 m.m Height—2300 m.m.
Wheel base	1622 m.m.
Specific pressure on ground	0·41 kg/cm.²
Track	1435 m.m.
Clearance	280 m.m.

Engine Four cylinder diesel engine with swirl chamber.

Engine Power	54 H.P.
R.P.M.	1300

Cylinders arranged vertically.

Bore	125 m.m.
Stroke	152 m.m.
Compression Ratio	16 : 1
Piston displacement	7·45
Firing order	1-3-4-2

Forced cooling water circulation system.

Combined pressure and splash lubrication.

Starting Engine 2 Stroke—Single Cylinder Petrol Engine—Two stage gear conductor and starting mechanism.

Engine Power	10 H.P.
R.P.M.	3500
Bore	72 m.m.
Stroke	85 m.m.
Compression ratio	6·2 1

Cooling combined with diesel engine cooling system

The disconnecting mechanism is arranged with automati centrifugal disengagement of gear wheel.

Transmission Clutch—Single Plate dry type. Mechanical

5—stage gear box with interlocking of changeover mechanism.

5 forward speeds and 1 reverse speed.

		Forward
Speed in k.ms./hr	1st Gear	3·59
	2nd ,,	4·65
	3rd ,,	5·43
	4th ,,	6·28
	5th ,,	7·90

(b) Dt. 54—contd.

		Reverse
Speed in k.ms./Hr.	1st Gear	2·4

Traction effort on hook :

1st Gear	2850 km.
2nd ,,	2100 km.
3rd ,,	1750 km.
4th ,,	1450 km.
5th ,,	1000 km.

Caterpillar Driving Mechanism.

Cast iron track shoe with grouser ground grip.
Each caterpillar contains 41 tracks.

Caterpillar tension gear fitted with spring damper.

Cogged driving wheels.

Balanced type track suspension on coiled springs.

Electrical Equipment.

Generator—60 watts—6 Volts—Single Wire system.
Two—Headlights.
One—Tail light.

Fuel

Diesel tractor, fuel (summer and winter grades) for main engine.

Fuel for starting engine : mixture consisting of :

gasoline	94-93%.
Diesel fuel Oil	6-7%

Capacity of fuel tanks

Diesel Oil	185 litres.
Gasoline	8·5 litres.
Fuel consumption of main engine	220 grammes HP/H

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(c) Kd-35

Characteristics

Caterpillar Type.

Wt. of Tractor	3,700 kg.
Overall dimensions	Length 3040 m.m.
Track	1,090 m.m.
Clearance	275 m.m.

Engine

Four-cycle Four-Cyclinder Engine.

Power	37 H.P.
Crankshaft Speed	1,400 R.P.M.
Cylinder arrangement.	
Vertical Bore	100 m.m.
Stroke	130 m.m.
Compression Ratio	17
Firing Order	1-3-4-2
Lubrication System	Combined Forced.

Circulation and Splash Lubrication.

The Diesel Engine is provided with an Air Healer.

(c) **Kd-35**—contd.

Starting Engine

Two Cycle Single Cylinder Carburetter Type.

Power	8·5 H.P.
R.P.M.	3,500
Bore	72 m.m.

The Starting Engine is mounted on a bracket of the Diesel Engine Flywheel case.

Transmission

Clutch—Dry Disc Single Plate Type.

Transmission—three way and a direct drive with 5 forward speeds and 1 reverse speed.

		Road Speed
Speed in k.ms. /Hr.	1st Gear	3·81
	2nd ,,	4·65
	3rd ,,	5·22
	4th ,,	6·13
	5th ,,	9·11

Reverse

3·54 k.ms/Hr.

Caterpillar Type of Track—Cast with Cam Adhesion.

Number of Shoes on one Side	31
Track Pitch	173 m.m.
Track width	280 m.m.

Electric Lighting

65 Watts—6 Volts—Type GBT-4541 Generator, with Friction Clutch, allowing the Generator to be disconnected easily.

Head Lamps	2
Tail Lamp	1

Fuel

For Main Engine—Diesel Fuel Oil (Summer and Winter Grade)

For starting engine—Petrol (Gasoline),
Tank Capacities :

Fuel Oil	97 litres
Petrol	3 litres.

Auxiliary Equipment

Drive for Power Take-off from Intermediate Transmission Shaft.

Speed of Power Take-off Shaft	544 R.P.M.
Pulley Diameter	360 m.m.
Width	200 m.m.
Speed of Pulley	695 R.P.M.

(d) **Kdp-35**

Characteristics

Caterpillar cultivating type tractor.

Wt. of Tractor	4100 kg.
Trackbase	1340 m.m.
Clearance	640 m.m.
Overall Dimensions	Length—3100 m.m. Width—1700 m.m. Height—2755 m.m.

(d) Kdp-35—contd.

Engine

Compressorless 4-Cycle Diesel.

Rated output . . . . 37 H.P.
Rated speed of Crankshaft . . . 1400 R.P.M.

Fuel

Diesel Oil.

Fuel consumption at rated output—220 g. per H.P. Hour.

Starting by means of petrol (gasoline) engine and compression release.

Transmission

Clutch-dry single plate, not normally engaged.

5-speeds forward and 1 reverse, 3-way transmission with 1 direct drive speed.

Rear axle transmission by means of bevel gears.

Turning mechanism : steering clutches and steering brakes.

Steering clutch transmissions—double stage reduction with spur gear wheels.

Speed in k. ms./Hr.

	Forward
Ist Geer	3·81
2nd „	4.64
3rd „	5.22
4th „	6.13
5th „	9.11

Reverse

3.54 k.ms./Hr.

Tractive effort . . . . . . 550 to 1750 kg.
Drawbar Horsepower 24

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Propelling System

Suspension—semi-elastic with transverse balance.
Springs: plate, not cut.
Caterpillar carriages—welded constructions.
8 tract supporting rollers, 4 per carriage.
2 track carrier rollers, 1 on each side of tractor.
Tension mechanisms—elastic with wound springs.
Caterpillar tracks with spade lugs.
Cast caterpillar links 200 m.m. wide

Hitching Gear

Rear Rigid.

(e) Mtz-1 & Mtz-2

Characteristics

Agricultural Universal Type tractor.

Wt. of Tractor MTZ-1 . . . . 3150 kg.
MTZ-2 . . . . 3250 kg.

Tread MTZ-1 tractor : front wheel 190 m.m. rear wheels adjustable from 1200 to 1800 m.m.

MTZ-2 Tractor : front and rear wheel adjustable from 1200 to 1800 m.m.

Clearance: MTZ-1 . . . . . 640 m.m.
MTZ-2 . . . . . 440 m.m.

(e) Mtz-1 & Mtz-2—contd.

Dimensions of Tractor

Height	2400 m.m.
Width	1885 m.m.
Length	
MTZ-1	3720 m.m.
MTZ-2	3660 mm.

Engine

Compressorless 4-cycle Diesel.

Rated output	37 H.P.
Rated crankshaft speed	1400 R.P.M.

Fuel Diesel Oil.

Fuel consumption at rated output.	220 grams per H.P. Hour starting by means of petro (gasoline) engine and compression release.

Transmission

Clutch—dry single plate, normally engaged.

5 Speed forward and 1 reverse, 3-way transmission.

Steering transmission—spur wheels.

Control by turning front wheels and by brakes.

Speed in k.ms./hour.

	Forward
1st Gear	4·56
2nd „	5·61
3rd „	6·44
4th „	7·38
5th „	12·95

Reverse

3·42 k.ms./hour.

Wheels

With low pressure pneumatic tyres.

Tyre sizes :		
	front	5·50
	rear	11·00-38 or 8·25-40.

Four wheels, of which 2 rear wheels driving.

Hitch Equipment

Swinging Type.

The tractor is fitted with a device for operation with hanging implements and with hydraulic control for the same.

(f) Mtz-7

Characteristics

Agricultural Universal tractor, allowing arrangement for orchard or garden work.

Wt. of tractor	1300 kg.

Tread—adjustable from 1000 to 1500 m.m.

Clearance for orchard arrangements	313 m.m.
Clearance for garden arrangements	520 m.m.

Dimensions of Tractor

Orchard arrangement—		
	length	2440 m.m.
	width	1264 m.m. (1000 m.m. tread).
	Height	1313 m.m.

Engine

4-cycle carburetter type.

Rated output	12 H.P.
Rated crankshaft speed	1600 R.P.M.

(f) Mtz-7—contd.

Fuel	Petrol (Gasoline)
Fuel consumption at rated output	275 grams per H.P. hour.

Transmission

Clutch—dry single plate, not normally engaged.

5-speed forward and 4-speed reverse.

4-way transmission.

Rear axle transmission by means of spur gear wheels

Steering transmission—spur wheels.

Control by turning front wheels and by brakes.

Tractor Speeds

Additional speed (at 900 R.P.M. engine speed) for operation with planting machines . 0·71 k.m./hr.

		Forward and Reverse
Speed in k.ms./hour	1st Gear	4·09
	2nd ,,	5·29
	3rd ,,	6·09
	4th ,,	12·73

Tractive efforts from 100 to 600 kg.

Drawbar Horsepower on 2nd speed . . 8·5 H.P.

Wheels

With low pressure pneumatic tyres

Tyre sizes—front—4·00—16
rear —8·00—32

Four wheels 2 of which are driving.

The tractor is fitted with a device for operating with hanging implements and with a hydraulic control for same.

(g) Kt-12

Chatacteristics

Logger type caterpillar tractor.

Wt. of tractor in running order		5800 kg.
Overall dimensions	Length	4505 m.m.
	Width	1900 m.m.
	Height	2415 m.m.

Distance between track centres	1480 m.m.
Clearance	540 m.m.
Tractive effort on hook	3100 kg.
Adhesion	0·394 kg/cm².

Engine

Four stroke gas-producer type

Cylinders	6
Bore	101·6 m.m.
Stroke	114·3 m.m.
Piston displacement	5·55 litres

Compression ratio 7·0 : 1, maximum power 45 H.P. at 2300 R.P.M. Engine started by a starter.

Lubrication System

By means of a gear pump.

Lubrication system filling capacity . . 7·0 litres

(g) Kt-12—contd.

Cooling system

Forced water circulation by means of a centrifugal pump.
Tubular type radiator.

Fuel feed system

Mixer, ejector type, Oil type air filter,
Carburetter, type K-12 Capacity of petrol (gasoline) tank for starting 7 litres.

Electric Equipment

Battery ignition.
Firing order—1-5-3-6-2-4.
Dynamo—TAZ-08 with relay-regulator.
Output—190
W.—Two accumulator batteries 6 V.
Capacity—112 Ampere-hours.
Electric connection—one wire system.
Lighting—2 headlights
Projector—1

Gas Producer—Reverse gasification process type.

Gasification chamber diameter	340 m.m.
Neck diameter	150 m.m.
Air port.	1
Air holes	10
Air hole diameter	10 m.m.
Total area of air holes	7·85 cm^2.
Distance from plane of air holes to neck	110 m.m.

Fire grate—fixed, demountable in three sections

Bunker capacity	0·20 m^3
Neck diameter of loading hatchway	336 m.m.
Height of gas producer	1660 m.m.
Wt. of gas producer not including fuel	217 kg.
Coarse cleaner, type Cyclone	
Number of coarse cleaners	2
Cooler type	Radiator
Cooling suface	3·85 m^3.

Fine cleaner—double section type with Rasching rings.
Volume of Rasching rings in Clutch, dry, twin-disc type.

Transmission *Speed-change gearbox.*

Five forward speeds and one reverse Gear ratios :

		Forward
Speed in k.ms./hour	1st Gear	3·714
	2nd ,,	1·87
	3rd ,,	1·20
	4th ,,	0·833 (Over-drive)
	5th ,,	0·609 (Over-drive)
		Reverse
		2·708

Main transmission. Bevel gears with straight teeth.

Gear Ratio	4 : 1

(g) Kt-12—contd.

Side Clutches—Dry, multi-disc type.

Side transmission—Spur gears with straight teeth.

Gear Ratio	5·2 : 1.

Brakes. Hand-brakes—band type, floating.

Arranged on the outer drum of side clutch.

Tractor suspension. On four quarter leaf springs.

Drive gears. Cast, with two tooth rims.

Number of teeth	12
Pitch circle diameter	470 m.m.

Gears arranged at the rear.

Idler-wheels.

Cast, with plain rim

Outside diameter	470 m.m.

Arranged at the front.

Track rollers. Pressed steel. Four on each side.

Outside diameter	650 m.m.

Track. Cast, adhesion lugs, number of shoes per 69-track.

Track pitch	120 m.m.
Width of track	340 m.m.

Track shoes linked by means of floating pins.

Winch. Single hauling, reversing, Chain driven from speed, change-gearbox.

Effort on winch	3500 kg.
Capacity of winch drum	70 m.m. of 15 m.m. diameter steel rope.

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The winch is hand operated by means of levers in the Driver's cab.

The winch is fitted with a band brake.

Loading Platform. Flat type, in two parts, welded.

APPENDIX V

IMPORTANT AGRICULTURAL IMPLEMENTS PRODUCED AND USED IN U.S.S.R.

Ploughs

1. *Five Furrow tractor plough. Model II*-5-35*M*.

This plough is meant to till the soil having a resistance upto 0·7 kg/cm^2.

2. *Vineyard Tractor Plough. Model IIB*-1-7.

This plough is used in vineyard and bush orchards and is furnished with two 450 m.m. wide bottoms, four 325 m.m. bottoms and one 350 m.m. lister bottom.

3. *Two Furrow Hanging Plough. Model II-H*-2-30-*M*.

The plough is used to till to depth of 25 cm. in soils having a resistance up to 0·7 kg/cm^2. The plough is designed to operate from a 15/20 H.P. tractor, having a hydraulic lifting device.

4. *Single Furrow Hanging tractor plough. Model II-H*-30.

This plough is used to work the soil for grain and garden sowing.

5. *Tractor plantation plough. Model II-H*-50.

This plough is used to work the ground upto a depth of 75 cm. for planting seedlings of vines, fruit and other trees.

5. *Bush and Marsh Tractor Plough. Model II-KB*-2-54.

The plough is used for use on marshy and virgin soils covered with bush and small stumps. This can operate on land covered with bush upto 1·5 m. high, having stubs and tree roots upto 8-10 cm. diameter. This is a double bottom plough.

Combines

1. Harvester combines for hemp.
2. Wheat and Harvester combines.
3. Flax harvesting combines.
4. Cabbage combines for digging and cutting cabbage heads.
5. Potato harvester.
6. Reaper and rake combines.
7. C4 independent combines for harvesting Cereals.
8. C6 Cereal harvester combines.
9. Stalimetic 6 tractor driven combine.
10. Silo combine.
11. Maize combine.
12. Potato combines.
13. Cotton harvesting combine—Vertical Spindle type.
14. Three Row Beet Harvesting Combine.

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Processing Machines

1. Machine for processing hemp.
2. Thresher for Flax.
3. Sieves for Maize, Flax, Sun-flowers.
4. Winnowing machines.
5. Lucerne seed clearing machines.

Seeding Machines

1. Seed drills for Flax—2·25 m.m. dia.
2. Cotton drills four row.
3. Fertilizer type drills.
4. Narrow spacing tractor drill for sowing grain crops.
5. Suspended seedling machines for planting seedlings in compost.
6. Potato planters—4 row square spot-wise.
7. Onion seedling planter.

Mowers

3 bar type & 5 bar mowers suitable for being worked with a 35 H.P. Tractor.

Earth Mowing Equipment

1. Scrapers.
2. Grader Elevator—350 to 400 Cu. metre/Hr. Capacity run with a 54 HP. Tractor.
3. Trench Excavator—80 Cum Breadth for making 1 metre—20 Cum deep Canals driven by a 54 HP. Tractor
4. Root stumpers.
5. Bund formers.

Other Miscellaneous Machines

1. Cotton gins.
2. Electric shavers for cutting wool.
3. Triple impulse—milking machine.
4. Pest control sprayers.
5. Straw and ensilage cutter.
6. Sprayer dusters
7. Wind mill water pumps. Developing one H.P. and given an output of 6 cubic metres of water per hour (Wt. 300 grams).
8. Thermo-electric battery (output 90 volts—3 Watts).
9. Soil testing portable sets.
10. Cotton cleaning machines.

Machinery for irrigation purposes

1. Spray irrigator with 250 nozzles which can irrigate 15 Hectares in 8 hours.
2. Revolving spray irrigator. It can deliver 30 litres per second and irrigate 6 hectare° per hour with a spray of 60 metres in radius.
3. Ditch diggers.
4. Five Stage—Spiral horizontal pump. Delivering 8 cubic metres water per hour.
5. Dredging machines for cleaning reservoirs. Cleaning canals form silt. This is boat shaped mobile plant. The pumps fitted to it take away the sludge through the suction pipe and deliver it through a flexible pipe 600 metres in length. The sludge is deposited on the banks of the canal.
6. Five stage deep well pumps with 8″ suction.
7. Drilling equipment for dry boring and wet boring.
8. Self-sucking pump (8 K.W.)
9. Transfer pumps for transferring water from the main canals to tributory canal.

APPENDIX VI

(*a*) AGRICULTURAL MACHINES AND IMPLEMENTS SEEN AT MOTOIMPORT IN WARSAW

Item	Price per piece £	s.	d.
Tractor Ursus C-45	822	0	0
Three-furrow tractor plough PC-1/3	140	1	0
Four-furrow tractor plough PC-1/4	147	10	0
Tractor cultivator KP3-A	112	17	0
Tractor disc harrow BTC-1	122	10	0
Tractor disc harrow LBD-45	158	4	0
Horse-drawn harrow BZL-2	4	6	0
Two furrow plough UNNC-2	13	19	0
Single-furrow plough UNRKP-5	7	10	0
Single-furrow plough "Piorun-1"	3	12	0
Land Packer, type U-3, syst. Campbell	73	4	0
Universal scuffler cultivator ridger RH-3	9	13	0
Three-row horse hoe WNO-3	22	10	0
Horse multi-row weeder PLW-1	78	12	0
Ridger NHO	3	12	0
Single wheel hoe "Gryf"	3	19	0
Hay rakes UNGA-2	51	16	0
Hand seed drill SHL	8	19	0
Tractor potato planter SK2-a	79	13	0
Tractor potato digger TEK-2	170	7	0
Horse potato digger LB-20	48	4	0
Power ensilage-cutter RSS-6	231	16	0
Feed grinder S-260	28	12	0
Diaphragm Pump PP	22	3	0
Potato steamer PG 100-1	16	2	0
Potato steamer PG 450-1	26	16	0

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The prices are to be understood *c.i.f. Bombay, packing included* and are subject to alteration.

(*b*) TECHNICAL PARTICULARS OF "URSUS C-45" TRACTOR SEEN IN WARSAW

Overall length	3522 m.m.
Overall width	1835 m.m.
Overall height	2190 m.m.
Wheel base	2035 m.m.
Track :	
Front wheels	1420 m.m.
Rear wheels	1505 m.m.
Ground clearance	280 m.m.
Minimum turning radius	4·5 m.m.
Load on front wheels	1400 kg.
Load on rear wheels	2300 kg.
Weight of tractor	3350 kg.
Maximum drawbar pull	2200 kg.
Diameter of front wheel	820 m.m.
Diameter of rear wheel	1210 m.m.
Width of front wheel rim	170 m.m.
Width of rear wheel rim	325 m.m.
Running speed : forward	3·3-16·7 k.ms./hour
reverse	4·1-11·9 k.ms./hour
Capacity of tanks :	
Fuel-tank	100 litres
Cooling system	45 ,,
Lubrication system	8 ,,
Maximum motor power	45 HP
Continuous motor power	38 HP
Motor speed at average load	630 r.p.m.
Motor speed at idle run	350 r.p.m.
Cylinder bore	225 m.m.
Stroke of piston	260 m.m.
Stroke capacity	10·3 litres
Compression ratio	4·75
Fuel consumption	260 g/HP/hour
Ratio of engine-oil consumption to fuel-consumption	6%
Belt-pulley	500 m.m. × 185 m.m.
Speed of belt at normal speed of engine	16·6 m/sec.
Power take-off speed at normal speed of engine	545 r.p.m.

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APPENDIX VII

TWO-WHEEL GARDEN TRACTOR MOTOROBOT PF-6 SEEN IN PRAGUE

Price : £250 F.O.B.

Engine

Single cylinder, two-stroke, vertical, gasoline, air cooled engine,

Bore 72 mm, Stroke 78 mm, Displacement 310 cm., Speed 2300 rev/min, Rated 6 HP, Magnetoignition, Crankshaft bearings 3 ball bearings, Connecting rod roller bearing, Fuel consumption 280—500 grams/HP/hr.

Clutch

Dry, single disc, operated by a hand lever.

Gear Box

Three forward speeds and one reverse Tractor speed with normal iron or pneumatic tyres :

I.	3·2 km.
II.	4·1 km.
III	7·3 km.
reverse	3·2 km.

Tractor speed with special small diameter iron wheels for rotary cultivator :

I.	2·1 km.
II.	2·7 km.

Differential

Differential is of automotive gear type and is provided with a lock

Wheels

The Motorobot may be equipped with iron ploughing wheels adjustable for 455 and 655 m.m. or automobile pneumatic wheels adjustable for 500 and 620 m.m.

Special iron wheels are supplied for rotary cultivating.

Ploughing wheels diameter	680 m.m.
width	160 m.m.
Small diameter wheels	470 m.m.
width	160 m.m.
Tyres	5·25-18

P.T.O.

The Motorobot is equipped with a P.T.O. shaft for direct drive of trailed implement. A belt pulley may be attached to the P.T.O. shaft.

Weight

With ploughing wheels	250 kg.
With tyres	235 kg.

General Dimensions

Length	2300 m.m.
Height	1050 m.m.

The range of implements available cover every requirement as the line includes :

Single-furrow reversible plough, two-row ridger, five-tooth spring cultivator, three-row hoe, three row marker, two wheel trailer, rotary cultivator, earthmover, power brush post hole digger, sprayer, cutting bar, disc harrows belt pulley.

GIPND—L—36 Dte. of Eco. & Stat.—29-2-56—1,000.

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